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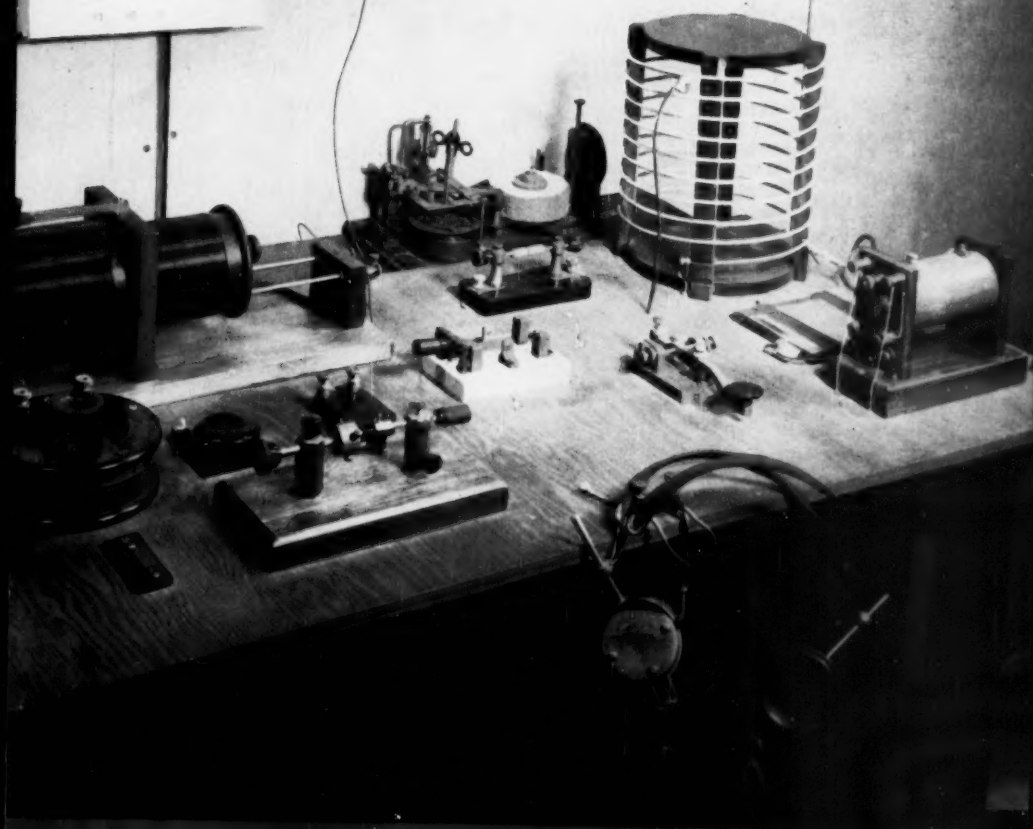
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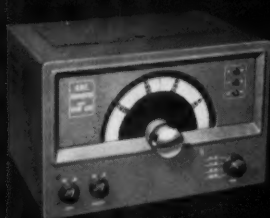
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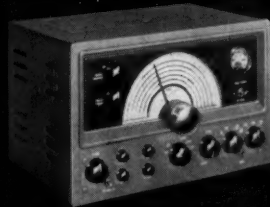
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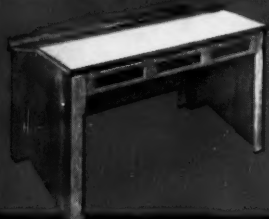
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TENTATIVE ITINERARY

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Azores	April 23rd	Ethiopia	13th
Morocco	25th	Ceylon	14th
United Kingdom	26th	Bangkok	16th
France	28th	Philippines	18th
West Germany	30th	Formosa	20th
Berlin, Ger.	May 4th	Okinawa	21st
Italy	6th	Korea	22nd
Tripoli	7th	Japan	26th
Greece	8th	Guam I.	27th
Middle East	11th	Wake I.	28th
		Hawaii	June 1st

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Chris Dunkle and Associates
740 S. Western Ave.
Los Angeles 5
California Representative

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Circulation Manager

J. A. MOSKEY, W1JMY
Assistant Circulation Manager

OFFICES

38 La Salle Road
West Hartford 7, Connecticut
TEL.: ADams 6-2535

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**EIMAC CERAMIC
4CX1000A TETRODE
POWERS NEW
COLLINS KW
LINEAR AMPLIFIER**



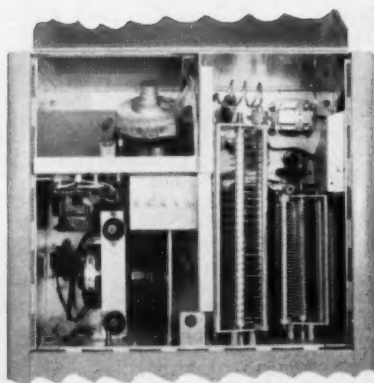
Collins' recently-announced S/line of amateur SSB equipment includes the completely self-contained 30S-1, a one kilowatt grounded-grid linear amplifier, powered by a single Eimac 4CX1000A ceramic tetrode. This amplifier provides full legal power input for SSB (1 KW average) or 1 KW input for CW, with 70 to 100 watts driving power, and rounds out Collins' distinguished line of SSB equipment for the amateur.

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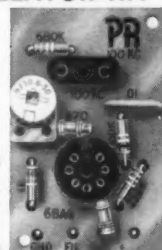
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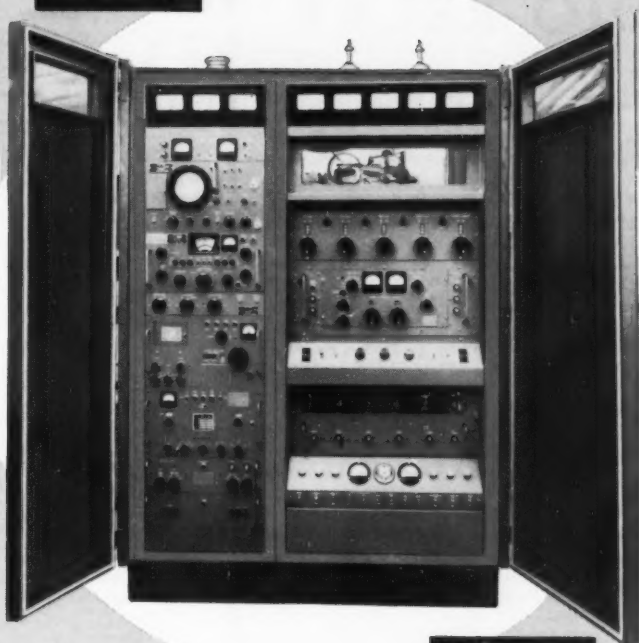
Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in QST. **ARRL Field Organization station appointments** are available in the areas shown to qualified League members holding Canadian or FCC amateur license, General or Conditional Class or above. These include ORS, OES, OPS, OO and OBS. SCMs also desire applications for SEC, EC, RM and PAM where vacancies exist. OES appointment is available to Novices and Technicians.

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GPT-10K



AN/FRT-39

GENERAL PURPOSE HI-POWER TRANSMITTER

The TMC Model GPT-10K, Radio Transmitter, is a conservatively rated, general purpose unit capable of providing 10 kw PEP output throughout the range 4 to 28 megacycles. All power amplifier stages are linear and the final is a ceramic tube for increased efficiency and reliability. Containing all components within a single attractive enclosure, the GPT-10K includes all excitation equipment, V.F.O., spectrum analyzer, F.S. Exciter, and complete "on the air" testing circuitry.

FREQUENCY RANGE: 4 to 28 mc continuous. **OUTPUT POWER:** 10 kw, 2 tone PEP, 35db 3rd order product suppression, 5 kw, 40 db. **OPERATING MODES:** CW, MCW, SSB, ISB, DSB, FS. **FREQUENCY CONTROL:** High stability VFO, 10 oven controlled crystals, three oven controlled crystals in FSK, provision for frequency synthesizer.

OUTPUT IMPEDANCE: 70 ohms unbalanced, 600 ohms balanced. **AUDIO BANDWIDTH:** 3 kc or 7.5 kc. either sideband. **POWER REQUIREMENTS:** 208/230 volts, 50/60 cps, 3 phase, approx. 13 kw.

**REQUEST
BULLETIN 207C**

The TECHNICAL MATERIEL CORPORATION

IN CANADA

TMC Canada Ltd., Ottawa, Ontario

Main Office: MAMARONECK

NEW YORK

THE AMERICAN RADIO RELAY LEAGUE, INC.,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.



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"It Seems to Us..."



FORTY-FIVE YEARS

May, 1914, is the birth date of our American Radio Relay League. In briefly commemorating this forty-fifth anniversary, we think it appropriate to quote liberally from a much earlier *QST* editorial recounting our beginnings:

"In 1914, with amateur radio in its swaddling clothes, with the handful of amateurs a feeble voice crying in the wilderness of despair, ARRL existed only as a grand idea in the mind of our founder-president, Hiram Percy Maxim — its only asset his will to see the idea through. Today we can look back upon years of accomplishment during which we have built our own unique cooperative association, healthy, mutually-owned, self-supporting, enjoying recognition as our spokesman, prestige as our representative before the world.

"We like to tell the tale of how ARRL came into being. With the crude apparatus of those early days, amateurs could not talk from one town to the next. But an intermediate amateur could relay for them if only there were some mutual understanding that each amateur would willingly so aid his fellows. Organization to supply this mutual need would work wonders, and if this spirit of one for all and all for one could help in practical operating, how much greater its opportunities in the realms of fraternalism and protection! And the organization should be owned by the amateurs themselves, not run for profit but for their common good.

"This was the Maxim vision of 1914. How the idea took form is an enthralling story of cooperative accomplishment. Early birds remember the little brown call books, the map of relay stations with a dot for every member, the little blue-backed *QST*'s mailed from the "office" in the attic of Clarence D. Tuska, our first secretary-editor, himself a college youth. Those were the beginnings. How richly the idea has succeeded is attested by the *QST*'s of the years, and by our members and strength to-day . . .

"We hams of America owe something to the men who have built up ARRL. First and always is the Old Chief, Hiram Percy Maxim. And there is Tuska, founder of *QST*. Then there are the [many] amateurs who during the years have sat as members of our Board of Directors, giving from their hearts of their time and thought that ARRL might advance. We always think with particular pride of that Board back in 1923 which deliberately voted

itself out of office that ARRL might enjoy a truly representative form of government. And then there were those hundreds of amateurs who lent the League thousands of dollars as working capital for the first two years after the war, with no security except their firm faith in a non-commercial amateur-owned society. These are but typical examples of the amateur spirit that has built our League.

"Let us not forget to-day that we have achieved these things by mutual forbearance, by the control of selfishness, by team-work. We have created something that is without parallel in American life, representative of all that is fine in a good, clean game. We may all be proud of it. Let us not be misled by those who, actuated by greed and jealous of our success, seek to take the control of our hobby into their hands and by planned misrepresentation are endeavoring to weaken our faith in our own selves. We have come a long way in twenty years, shoulder to shoulder. Together we have worked these marvels. We know that amateur radio has a rich destiny. Arm in arm we go on towards it."

BOARD MEETING

On May 15, the sixteen amateurs who have been named by Full Members of the League in the U. S. and Canada to represent them in matters of ARRL policy will meet in Hartford. There this Board of Directors will examine the progress of the League through the numerous reports required of committees on special matters; of the General Manager on membership matters, legislative and regulatory subjects (with special attention to the forthcoming world radio conference) and business operations; of the Communications Manager on all phases of the League's field operating organization, contests, awards, etc.; of the Treasurer on the status of the League's finances and investments; and of each individual director on the status of affairs in his division. With the situation as concerns amateur radio thus brought into focus on a nationwide scope by elected representatives of individual amateurs, the Board is enabled to come to decisions of policy and to instruct the League's officials accordingly for the coming year.

At press time we have notice, served in advance as required of proposed amendments to our Articles and By-Laws, of several matters to be presented for Board consideration.

(Continued on next page)

These include a proposal to raise membership dues to \$5 per year in the U. S. (\$5.25 in Canada); to revise the make-up of the Executive Committee; and to provide that a vice-director may represent his division at the Board meeting should the director be incapacitated through illness. But the agenda is wide open — no subject is barred, and at the meeting undoubtedly some dozens of new problems and proposals will be discussed. If you have views on amateur matters of the day or what you think is a good idea to improve the status of amateur radio, convey the information to your director. His address is on page 8.

Hamfest Calendar

(See page 91)

COMING A.R.R.L. CONVENTIONS

June 19-21 — ARRL National Convention, Galveston, Texas
 July 4-5 — Pacific Division, San Jose, Calif.
 July 24-26 — Southwestern Division, Pasadena, California
 August 15-16 — Pacific Div., Honolulu
 August 22-23 — Central-Midwest Divisions, St. Louis, Mo.
 September 5-6 — N. E. Division, Hartford
 October 3-4 — Roanoke Division, Richmond, Va.

MASSACHUSETTS STATE CONVENTION

Swampscott — May 17, 1959

The famed New Ocean House Hotel at Swampscott will be the scene of the Massachusetts State Convention May 17, sponsored by the Federation of Eastern Massachusetts Amateur Radio Associations. The location is nine miles north of Boston, on Route 129, connecting with Routes 1 and 128, with plenty of free parking. Registration and an extensive exhibit hall open at 9 A.M. Program features will be technical talks, demonstrations, net meetings and special events for the YLs (hams or not). Talk-in stations will cover 2, 6 and 10 meters. Advance registration is \$7.50, including roast beef banquet dinner. At the door, registration alone will be \$3; if still available, banquet tickets will be \$5. Send your check to Horace Snow, W1YYJ, 15 MacArthur Blvd., Danvers, Mass., together with a #8 self-addressed stamped return envelope.

Strays

In late March the press services carried reports on the feat of MIT's Lincoln Laboratory in bouncing signals off the planet Venus. One of the engineers on this job was W1OUN, long-time v.h.f. enthusiast.

OUR COVER

Just another equipment shot? Not at all. Our cover this month depicts an amateur station as it might have looked forty-five years ago, when the League was founded. This setup is a permanent exhibit at the museum of the Antique Wireless Association in Holcomb, New York.

Turn to page 92 and read all about the Antique Wireless Association, as related by W2ICE.

Strays

Word comes via UA1DZ that there will be another U.S.S.R. International C.W. DX Contest in May as in the past. Official rules have not been received at this writing, however, from the Soviet Central Radio Club, sponsors of the activity. But if the U's start calling CQ Test at 2100 GMT and passing out RST plus QSO serial numbers to all comers some Saturday in May, don't say we didn't warn you!

New definition of an old timer — one who has made the last payment on his rig.

One fellow's XYL said she was disappointed because he had never gotten his name or call in QST. She added, "You probably won't get your call in print until you appear in 'Silent Keys'."

— K9EUF



This is how W2HLY retires an old faithful 852. Rather than heaving it in the ashcan, he made it into a lamp, and it now occupies a place of honor in his shack.

The World Above 20,000 Megacycles

Amateur Communication Techniques for the Superhigh Frequencies

Microwave log of W2UKL and W2RDL

DATE	TIME	STATION	MODE	FREQ.	POWER	ANTENNA	HEIGHT	REMARKS
12/29	12:00	W2UKL	21,000 Mc.	1/2	25	25	14 miles	Highest frequency for voice communication by amateurs - Distance: 25 feet.
12/30	12:00	W2UKL	21,000 Mc.	1/2	25	25	14 miles	Extended dx record to 140 feet
12/31	12:00	W2UKL	21,000 Mc.	1/2	25	25	14 miles	Extended dx record of 140 feet to 1/2 mile.
1/1/50	12:00	W2UKL	21,000 Mc.	1/2	25	25	14 miles	Extended dx record of 140 feet to 1/2 mile.
1/2/50	12:00	W2UKL	21,000 Mc.	1/2	25	25	14 miles	Extended dx record of 140 feet to 1/2 mile.
1/3/50	12:00	W2UKL	21,000 Mc.	1/2	25	25	14 miles	Extended dx record of 140 feet to 1/2 mile.

BY

DR. A. H. SHARBAUGH,*

W2UKL,

AND R. L. WATTERS,**

W2RDL

AS MAY be seen from the log excerpt above, we have two new DX records in the microwave region — 14 miles on 21,000 Mc. (14 mm. in wavelength) and 150 feet on 50,000 Mc. (6 mm. in wavelength) — for two-way communication by voice. A considerable amount of activity on microwaves took place in the Schenectady, N. Y., area, during the past several months, on the highest frequency band, 21,000 to 22,000 Mc., allotted to hams. In addition, experiments and successful communication were carried out in the unassigned and almost unexplored frequencies above 30,000 Mc.

The work on 50,000 Mc., believed to be the highest frequency ever used by radio amateurs, is more than double the frequency used by the authors in 1946 when they were first to communicate on the 21,000-Mc. band.¹ A check of informed sources indicates the two-way communication on 50,000 Mc. may constitute a record in commercial circles as well.

After several months of experimentation with the 50,000-Mc. equipment to be described later, successful two-way communication by voice was first established on July 29, 1958, between two sets of equipment with their antennas 25 feet apart. Signals were quite strong over this distance, but erratic behavior of some components in the gear prevented making check over a greater distance.

More work on the equipment during the next few weeks resulted in extending the distance over which two-way voice communication could be maintained to 150 feet on September 27, 1958. Each transmitter-receiver unit was mounted on a table with wheels so that after the initial tune-up, the equipments were simply rolled further and further apart until the signals became too weak to be intelligible. Transmissions over the 150-foot

distance were carried on for several hours using an estimated r.f. power of one microwatt! This minute power was the limiting factor in the transmission range; coverage of several miles should be possible at 50,000 Mc. with improved equipment: several milliwatts of r.f. power and greater receiver sensitivity.

After the experiments at 50,000 Mc. the authors decided to attempt an extension of their two-way record on 21,000 Mc., 800 feet, set in 1946. The same microwave oscillator tubes, waveguide and fittings from the 50,000-Mc. experiment were used and will subsequently be described in detail.

For years our two-way records for the amateur bands from 50 Mc. up carried a record of 800 feet for the 21,000-Mc. band. The calls were WINV/2 and W9SAD/2, but the names of the holders were those in the byline of this article. Feeling that it was of vital importance to a future generation of hams to stake out a claim for amateur radio in the as yet unassigned region above 30,000 Mc., W2UKL and W2RDL went at it again. After much experimentation they succeeded in generating enough signal on 50,000 Mc. to work two-way over a distance of 150 feet. This is believed to be the highest frequency ever used for communication, amateur or otherwise. The authors also made extensive improvements in their gear for 21,000 Mc., and were able to extend their record for that band to some 14 miles. Though it may be some time before you can run out to the corner store and buy parts for their kind of microwave station, we think you'll be interested in this account of amateur pioneering in an almost unknown field.

* 39 Pine St., Scotia 2, N. Y.

** 1581 Clifton Park Road, Schenectady 9, N. Y.

¹ Sharbaugh and Watters, "Our Best DX — 800 Feet," QST, August, 1946.



These five sleepy-eyed Schenectady amateurs gathered at 5 A.M. for the 14-mile record attempt on 21,000 Mc. Left to right: W2UKL (coauthor), K2UNN, W2JZK, W2RDL (coauthor) and W2KLM.

On Saturday, October 4, 1958, the two sets of gear were tuned up at one location. One transmitter-receiver unit was then loaded into W2RDL's station wagon and hauled to a vantage point about $\frac{3}{4}$ of a mile away for a test transmission. Gonset Communicators on the 144-Mc. band provided liaison between the locations while the microwave gear was being readied. Horn antennas, aimed visually with field glasses, were used initially. Later, 15-inch diameter parabolic reflectors were tried at both ends of the circuit with considerable improvement in signal strength.

During this test, two klystrons designed for operation at 36,000 Mc. (8 mm. in wavelength) were tried in the gear, but this attempt at two-way communication was unsuccessful because one tube developed an internal short circuit.

The 21,000-Mc. signals were so strong over the $\frac{3}{4}$ -mile path that we immediately scanned topographical maps and the horizon for a more distant vantage point. Mount Rafinesque, 14 miles away near Troy, N. Y., referred to as Bald Mountain by local inhabitants, was selected. This name owes its origin to a complete absence of trees and shrubs on the mountain peak, so it is ideal for line-of-sight communication.

A u.h.f. television station at this site provided the necessary 115-volt power, and its tower was a convenient sighting landmark for aiming the antenna on the equipment at the Schenectady end of the circuit. The parabolic antenna on the Bald Mountain gear was aimed at a large water storage tank located near the gear in Schenectady.

We had anticipated ruinous overloading of the television receiver used as the i.f. amplifier, from the powerful television transmitter on the mountain. So, to avoid this problem, the crew of helping hams was rounded up at daybreak on Saturday, October 18, 1958. One set of gear was again loaded into W2RDL's station wagon and hauled up Bald Mountain.

Both microwave equipments were in operation by 9 A.M. and contact was established at 9:10 A.M. over the 14-mile path. Again, Gonset Communicators on 144 Mc. permitted liaison between the locations, but the microwave gear worked so well that it was unnecessary to further utilize the auxiliary 144-Mc. link. Horn-type antennas were tried at both ends of the circuit, in place of the parabolic antennas shown in the photographs.

Communication was still possible, but with considerable reduction in signal strength.

Just to see if the television transmitter actually would interfere with our microwave gear, we kept the latter operating until the station came on the air at 12:30 P.M. No trace of interference with the microwave gear could be detected, so our 5 A.M. arising had been unnecessary after all! Since the television transmitter was on Channel 35 in the u.h.f.-TV band, it was far removed in frequency from our i.f. amplifier on Channel 2.

The 21,000-Mc. signals were sufficiently strong over the 14-mile path to assume that two-way communication on this band could be established over an airline distance of about 40 miles from Schenectady to Mount Greylock in Western Massachusetts. An attempt at a new record on this band will be made during the summer.

Meanwhile, back on the workbench, the two equipments are being improved. Larger parabolic antennas are being readied. Low-noise pre-amplifiers following the crystal mixers in the receivers will be provided, and any other means by which a few db. of improvement can be obtained will be included.

The authors would like to acknowledge the assistance of the following people in the 21,000-Mc. distance record: Ted Swartz, W2KLM; Ed Neal, W2JZK; Bill Havens, K2ZLX; Paul Perrone, K2UNN; and Herb Singer of TV Station WTRI. We are also indebted to the Receiving Tube Department of the General Electric Co. for encouragement and assistance in these experiments.

The 50,000-Mc. Experiment

The equipment used in the 50,000-Mc. (6 mm.) transmission was basically similar to that used in setting the original 21,000-Mc. record thirteen years ago.¹ A block diagram of the circuit is shown in Fig. 1, in which waveguide and coaxial transmission line connections are indicated by double and single lines, respectively.

Using this circuit, the r.f. carriers of the two communicating stations are transmitted simultaneously and duplex communication, like that employed on land telephone lines, is accomplished as follows:

At station 1, r.f. power at frequency f_1 is fed through a crystal mixer and on to free space. A

part of this power is absorbed by the mixer. An identical arrangement at station 2 transmits power at a frequency f_2 , so that $(f_1 - f_2)$ equals the intermediate frequency. Thus a signal at this difference frequency may be amplified and detected at both stations. This scheme permits the same tube to operate as both local oscillator and transmitter and so reduces by one-half the necessary transmitting and receiving equipment. Furthermore, should it be desired, automatic frequency control circuitry is required at one station only, since it is only necessary that the two transmitted signals be held at a constant difference frequency.

Description of Circuit Components

The component most critical in design and adjustment is the harmonic generator into which fundamental power is fed and power is extracted at the second harmonic. Fig. 2 shows it to consist of two pieces of rectangular waveguide with different internal dimensions. These are placed at right angles to each other and a crystal diode is mounted on the broad surface of the smaller waveguide.² A standard coaxial connector on the opposite face is used to make connection to a d.c. milliammeter to monitor the power input. Fundamental power fed down the larger waveguide causes currents to flow in the semiconducting crystal diode. Due to the nonlinear response of the crystal, currents flowing at harmonics of the fundamental frequency are generated and harmonic power is propagated down the smaller guide. The sliding short-circuit plungers which terminate the two waveguides are used to optimize the fundamental power flowing into and harmonic power out of the nonlinear element.

Waveguides behave like high-pass filters; i.e., all wavelengths longer than a critical value λ_c are highly attenuated. The critical or cutoff wavelength is determined by the large dimension of rectangular waveguide. In our case, $\lambda_c = 1.2$ cm., and we have about 15 db./cm. attenuation of the fundamental 25,000-Mc. power. Thus a piece of small guide ten centimeters in length provides about 150 db. attenuation to the fundamental and insures that we are transmitting with harmonic and not fundamental power. (See component marked *filter* in Fig. 1.) Since the generated harmonic power drops about 10-15 db. per higher harmonic, very small amounts of power are generated at harmonic frequencies above 50,000 Mc.

It is difficult to estimate the amount of power which was generated at the second harmonic. If we assume approximately 15 db. loss in conversion to the second harmonic, an upper limit of 150 microwatts is set by the available fundamental power of about 5 milliwatts. On the other hand, we measured about 10^{-6} amp. of rectified crystal current across an estimated impedance of about 10^3 ohms. Therefore, a minimum in the generated 6 mm. power is $10I^2R = 10^{-5}$ watts,

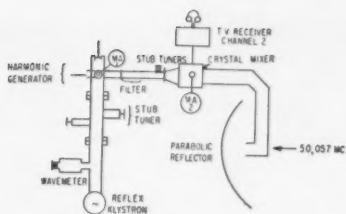


Fig. 1—Block diagram of the 50,000-Mc. transmitter-receivers used by W2UKL and W2RDL. The precise frequency given at the lower right should not be taken too literally. Only the 57-Mc. frequency difference between the two oscillators is important.

assuming 10 per cent conversion efficiency of r.f. to d.c. in the crystal detector. Thus the available power is very small, and is probably of the order of a microwatt. The possibility of burns by r.f. power was indeed remote!

The diodes used as nonlinear elements were selected 1N26 silicon crystals. The amount of output was very sensitive to rotation and amount of insertion of the crystal cartridge in its coaxial mount. From 1 to 5 ma. of rectified d.c., indicating approximately 1 to 5 microwatts of power, was used; the harmonic power was proportional

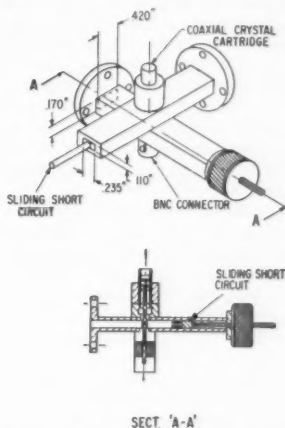


Fig. 2—Details of the harmonic generator used in the 50,000-Mc. experiment.

to the d.c. current throughout this range.

The double-ended mixer block in Fig. 1 is shown in detail in Fig. 3. It was designed for operation at 23,000 Mc. and so performed rather poorly at 50,000 Mc. To avoid excessive mismatch it was coupled to the small-sized waveguide through a tapered section about one inch in length. Again, the orientation and amount of insertion of the coaxial crystal cartridge were extremely important. Several 1N53 silicon diodes were tried as mixers and found to be somewhat better than the selected 1N26 units. This was expected since they are designed for operation in 8-mm. wave region, whereas the 1N26 is designed

² Gordy, Smith and Trambrulo, "Microwave Spectroscopy," published by John Wiley, New York, N. Y. (1953), page 50.

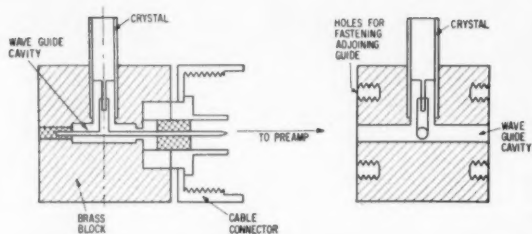


Fig. 3—Cutaway view of the double-ended mixer block.

for 12-mm. operation. If a sufficient number of 1N53 diodes were available to permit selection, there is no doubt that the transmitting range could be greatly increased. The outer diameter of the 1N53 crystals was increased to that of the larger 1N26 units by the use of a brass sleeve. This permitted their use in the mixer blocks designed to fit the larger unit.

One of the problems associated with the circuit of Fig. 1 is the lack of a suitable amount of local oscillator power, resulting in excessive conversion loss in the mixer. For example, the conversion loss might be 50 db. when mixing two 50,000-Mc. signals when the local oscillator power is of the order of 10^{-6} watts, and only 10 db. when the local oscillator power is increased to 10^{-3} watts.³ To circumvent this trouble, in some experiments we removed the mixer block and accomplished mixing in the harmonic generator section. In this case the i.f. output was taken off at the connection normally used to measure the mixer crystal current. Since the klystron oscillator delivered milliwatts of power on the fundamental frequency—a mere 25,000 Mc.—we had adequate local oscillator signal level.

Both parabolic reflectors and tapered rectangular horns were used as antennas. The horns were more convenient to aim and consequently were used in preliminary experiments before making the final tests for maximum communication range. At such short wavelengths, large gains in effective power can be achieved with only a small antenna. The largest horn had a rectangular aperture of only 4 by 5 inches at its open end and was 10 inches long. The gain of even this horn was in excess of 20 db.

Much larger gains are provided by parabolic reflector antennas. For example, our reflectors were 15 inches in diameter and the calculated gain was about 48 db. (See Appendix A for a calculation of this gain figure.) A 1-degree beam width attained with a parabolic reflector is sufficiently narrow that it is expedient to initially align the transmitters with horns and then change over to the parabolic antennas.

The frequency of the transmitted power was measured at its fundamental by the use of the resonant cavity wavemeter shown in Fig. 1. Resonance was indicated by a dip in the rectified output current. Multiplication by a factor of two then gave the frequency to within about ± 15 Mc. out of 50,000 Mc. When not in use, the

wavemeter was replaced by a sliding short circuit in the arm of the "T" section connecting the wavemeter to the main waveguide. The location of this short circuit was, of course, adjusted for maximum output. There was little worry about staying within the band since the spectrum above 30,000 Mc. is currently "free for all".

Several methods were used to ascertain that the transmission was accomplished at the second harmonic frequency and not at the fundamental. First a metallic reflecting plane was inserted in the transmission path in front of the antenna. This stopped the transmitted signal and the reflected wave pattern repeated itself as the reflecting metal was moved a half wavelength (3 mm.) in space. Second, removal of the harmonic generating crystal completely eliminated the transmitted signal. Third, the frequency of the local oscillator was changed continuously, and the two fundamental frequencies were noted at which there was an output from the i.f. amplifier. These *fundamental* frequencies were separated by the i.f., 57 Mc., as they should be for transmission and mixing at the second harmonic.

Normally, waveguide connections are made with choke joints. This is accomplished by the use of flanges which have a built-in radial cavity resonant at 25,000 Mc. which provides a low-impedance path for r.f. currents at the junction. This reduces the losses over that for an ordinary butt joint. Such choke joints were used in the portion of our system which was operating at the fundamental frequency, but were not used in those parts of the system which transmitted harmonic power. At double frequency, the chokes would have caused increased losses. Thus, flat flanges, screwed together at four points around their periphery, served as connections in the 50,000-Mc. portion of the plumbing circuit.

Since all available power had to be conserved for useful communication, no isolating attenuation could be used in the various parts of the system. As a result, the system was extremely frequency sensitive, and a change of a few megacycles caused the amount of radiated power to change drastically. To maximize the output power at a single frequency, eighteen separate adjustments by actual count had to be made; and a large number of these were interdependent! This procedure had to be repeated at each new frequency and made the tuning of the klystron tubes rather painstaking to yield the correct i.f. It was during this part of the experiment that the authors were nearly driven to elbow-bending or

³ Johnson, *IRE Transactions*, MTT-2, No. 3, 27 (1954).

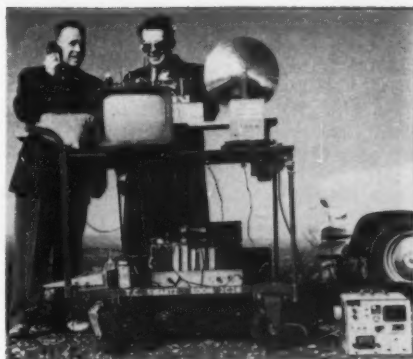
some other more relaxing form of indoor sport! Fortunately, once a pair of tubes had been finally tuned to the proper frequencies, they remained quite stable aside from an initial frequency drift during warmup.

Two types of klystron tubes were used for generating power in the 12-mm. wavelength region: the General Electric Z-668 and the 2K33A. The principle of operation and a cross-sectional view of the Z-668 was given in our prior article.¹ Unfortunately, these tubes have not been produced commercially to date; we are indebted to the designer, Dr. James M. Lafferty of G.E., for the loan of a number of them. Although the power output from the Z-668 is a little lower than the 2K33A, the tuning is so much smoother (constant output over a wide frequency range), that we preferred to use them whenever possible.

Since the frequency of klystron tubes is dependent upon the various applied voltages, it was necessary to use voltage-regulated power supplies. An annoying 60-cycle ripple on the signals was evident, if the supplies were not regulating properly. This residual ripple could probably be reduced still further if the heaters were operated with d.c. voltage. Forced air cooling of the klystrons was employed to insure long tube life and to minimize frequency changes due to breezes and drafts. The useful bandwidth of the i.f. amplifier was about 2 Mc., hence the two tubes had to be maintained at about 57 ± 1 Mc. apart in frequency. (The mid-frequency of TV Channel 2 is 57 Mc.) No automatic frequency control was employed and slow drifts occurring over several minutes could be compensated for by adjustment of the focus or reflector voltages. This procedure provided a finer control of frequency than could be accomplished by mechanical tuning of the tube.

The output frequency of the klystron decreases about a megacycle for an increase of one volt applied to the reflector, and no current is drawn by this electrode, so these tubes are easily frequency modulated. The same modulation circuit was used as described previously.¹ During preliminary adjustments it was convenient to modulate with a few volts output from a 1000-cycle generator. Low-impedance carbon microphones were used to minimize the 60-cycle pickup problem encountered with high-impedance crystal microphones.

A G.E. 14-inch portable television receiver tuned to Channel 2 served conveniently as i.f. amplifier and discriminator (using the slope of the response curve). The audio was taken off between the video output connection to the picture tube and the chassis. Crystal earphones were used, although the raster pattern could also be used for visual indication of output. The contrast control served as the gain control. An increase in noise could be heard readily when the mixer crystal was plugged in; hence the television set probably was performing efficiently as an i.f. amplifier. Its noise figure is estimated to be roughly 10 db. on Channel 2. It would be difficult to construct a



W2KLM and W2RDL with the equipment at the Bald Mountain end of the 14-mile 21,000-Mc. circuit. The high-voltage power supply for the klystron oscillator is on the lower shelf of the wagon. The portable TV receiver serves as the receiver i.f. system.

suitable i.f. amplifier with a lower noise figure without going to a lot of special design and construction.

Conclusion

It is impossible at present to estimate the expected maximum range of communication at 50,000 Mc. because of (1) the lack of performance data for the crystal and mixer at these frequencies; and (2) the uncertainty as to our available r.f. power. Certainly one important theoretical limitation for long-distance communication is the strong absorption by oxygen in the air,⁴ about 14 db./mile. Our 150-foot working range, however, was largely determined by the low efficiency of power generation at the 6-millimeter wavelength. A more efficient harmonic generator could be constructed by actually mounting the crystal slab and cat's whisker in the small waveguide itself.² Furthermore, the use of crystals and a mixer block designed for use at 25,000 Mc. and insufficient r.f. choking at the i.f. output connection have also undoubtedly limited the available 50,000-Mc. power output. One could avoid most of the oxygen absorption by shifting about 2 mm. in wavelength on either side of the peak absorbing frequency of 60,000 Mc. (5 mm.). However, we could not do either because we did not have enough power to work at the third harmonic wavelength, nor a klystron which would operate at a fundamental frequency of 16,000 Mc. (18 mm.).

Transmissions were maintained for several hours at 50,000 Mc. The quality was good; the chief objection was some 60-cycle ripple. Each transmitter-receiver was mounted on a table with wheels and the two were simply rolled apart until the signal became too weak to be intelligible.

Details of the 21,000-Mc. Experiment

Our 1946 transmission¹ marked the first use

⁴R. Beringer, *Phys. Rev.*, Vol. 70 (1946), p. 25



The Schnectady end of the 21,000-Mc. circuit, manned by W2UKL and K2UNN. Water tower at the left was used as a landmark for aiming the antenna system at the Bald Mountain end of the 14-mile circuit.

of the highest frequency band allotted to hams; 21,000 to 22,000 Mc. The maximum two-way distance which was covered was 800 feet. We had been able to establish one-way communication at a distance of one-half of a mile, but due to the lack of sensitivity of one of our receivers, two-way work was impossible over this distance in 1946. But in 1958 the advent of television had made available i.f. amplifiers with much improved noise figures, and calculations of possible range showed that we should be able to greatly extend this distance with the use of this improved receiving equipment.

In this amateur band we are confronted with absorption of the radio energy by water vapor in the air, but the magnitude of this absorption is known (1 db./mile at 100 per cent humidity) and may be taken into account. Unlike the fourteen-fold stronger oxygen absorption at 50,000 Mc., we could always minimize the amount of water vapor attenuation by waiting for a dry day to do the experiments!

The 21,000-Mc. equipment was identical to that used in the 50,000-Mc. experiment except that the harmonic generator and filter were removed. In the 50,000-Mc. circuit the power level was readily monitored by observing the rectified current flowing through the harmonic generator crystal. However, with the removal of the harmonic generator, it was now necessary to devise the circuit of Fig. 4 to measure the power output from the klystron tube. With this circuit the power level was indicated by the magnitude of the mixer current, while the crystal was simultaneously connected to the i.f. amplifier input. Capacitance C_1 represents the total shunt capacitance; Twin-Lead, input to receiver, and mixer block. Inductance L resonates with C_1 at

57 Mc. and C_2 is a 0.005- μ f. bypass capacitor.

In contrast to operation at 50,000 Mc. the performance data of 1N26 crystals is available for 21,000 Mc. Hence, a relatively reliable calculation of the expected range can be made. This was highly desirable for our tests since transportation of the microwave gear to two elevated locations in the field involved considerable work and man power. We thus wished to minimize the number of field tries for maximum distance. The method of calculating the probable working range, about fifty miles for the equipment used in our experiments, should be of interest to those amateurs who may be thinking of an assault on our 14-mile record! Details are given in Appendix B.

Appendix A

The gain in db, G , of a uniformly illuminated parabola (our diameter, D , was 15 inches) is readily computed as:

$$G = 10 \log_{10} \frac{16D^2}{\lambda^2} = 48 \text{ db.}$$

From classical optics, the angle θ between half power points, is given by

$$\theta = \frac{2\pi 70\lambda}{360 D} \cong \frac{\lambda}{D} = .017 \text{ ra. (1}^\circ\text{).}$$

Appendix B

The ability of a receiver to detect weak signals is expressed in terms of the overall effective noise figure F'_{rec} which expresses as a power ratio how many times worse a given receiver is than an ideal receiver. The two most important sources of noise in a receiver are the mixer noise, and the i.f. amplifier noise. In addition to this, the efficiency of conversion of r.f. to i.f. power L must also be taken into account. When all these factors are

(Continued on page 190)

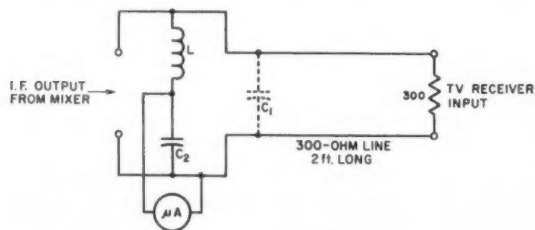
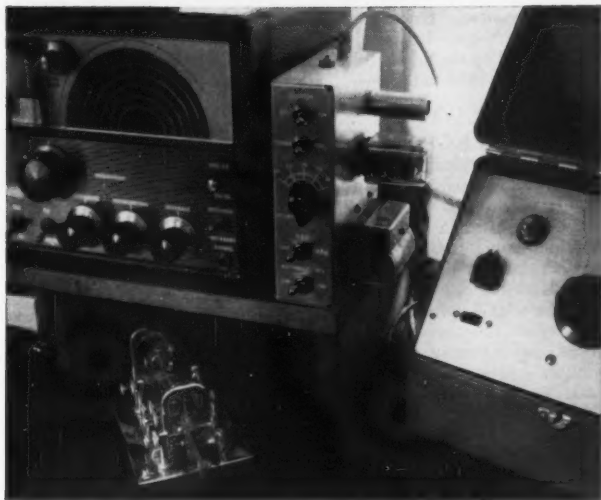


Fig. 4—Circuit used for monitoring power in the microwave experiments, where a television receiver is used as the i.f. amplifier system.



Monitrol mounts handily alongside the station receiver. From top to bottom the switches are, as designated in Fig. 1, S₅, S₄, S₁, S₃ and S₂. Conelrad monitor can be seen at right.

"Monitrol"—A Station Control Center

Combining Controls, Key and Monitor

BY R. B. SHREVE,* W8GRG

If you prefer your controls scattered all over the shack instead of at your finger tips, this article is not for you. However, if you appreciate the convenience of an inconspicuous well-located control center, this unit by W8GRG is your meat.

EVERY operator has his own ideas of what he wants in the line of simplified control at his operating position. At W8GRG, a father-and-son installation, various ideas have been batted back and forth, eventually crystallizing into the following specifications:

1. Full break-in operation on c.w.
2. A monitor that requires no tuning regardless of the band or frequency being used.

*2830 Winthrop Road, Shaker Heights 20, Ohio.

3. No interference with the push-to-talk phone operation already installed.
4. Adaptability to use with either a separate receiving antenna (to start), or a common antenna using a t.r. switch (when we get one).
5. Automatic (electronic) keying for those who like it, with provision for easy changeover to bug or straight key for those who don't.
6. Portability; suitable for Field Day, Civil Defense, or other emergency use.

Monitrol is the result. It meets all the requirements. The circuit, shown in Fig. 1, has three basic parts.

Break-in Keying

The break-in unit is patterned on a circuit in the *Handbook*, which uses a s.p.d.t. relay to key the transmitter, ground the receiving antenna terminal, and mute the receiver by application of cut-off bias through the r.f. gain control.

A word about the basic station equipment. The transmitter is a Viking II, modified to include grid-block sequence (differential) keying, and push-to-talk phone operation. The latter is accomplished through a relay installed in the transmitter, with its contacts in series with the "plate" switch that controls the antenna relay and the high voltage supply. This push-to-talk relay can be operated by a switch on the microphone, and by a "send-receive" switch used on

There are two auxiliary controls connected

¹ *QST*, February, 1955.

L₁—Slug-tuned inductor. See text.
S₁—2-pole 5-position rotary.
S₂-S₅ inc.—S.p.d.t. toggle
R₁-R₈ inc.—See text.

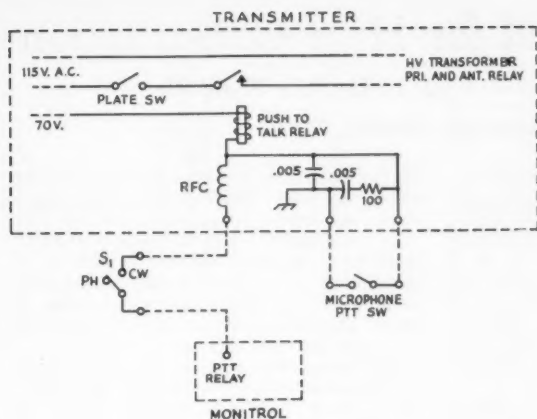


Fig. 2—A push-to-talk relay was added to the Viking II transmitter as shown. S_1 is an external switch formerly used for "send-receive."

coil is wound on a slug-tuned core from a surplus unit we had in the junk box, using fine cotton covered wire. We mounted the core in a chuck on our lathe, wound on several hundred turns, and measured the inductance with a bridge. It read 7.5 mh.; we wanted 17.8 mh. with a center tap, so we brought out a loop for the tap, ran the lathe a while longer, and measured the inductance again. It was 19 mh. this time, so we backed off to 18, taped the winding to hold it together, sprayed it with Krylon, put it in the circuit, and it tuned both sides of zero-beat with the receiver b.f.o. on the first try! If you don't think you have that kind of luck, save yourself trouble and order a spare set of components for your receiver b.f.o. from the manufacturer.

Heater current for the 6C4 is taken from the receiver at the connection on the rear of the chassis provided for battery operation. To get plate voltage we tapped the 150-volt regulated supply for the receiver oscillators. Output of the monitor is delivered to the receiver using shielded microphone cord, plugged into the receiver "Phono" jack. Who wants to play records through a ham receiver anyway?

The receiver can be easily restored to its original condition. Nothing inside was disconnected except one of the two grounded pins on the power socket on the rear of the chassis. A wire was added to bring +150 volts to this pin, and the phono plug input was connected to the cathode of the second detector (where the receiver b.f.o. hooks in) through a 200- μ f. capacitor. There is no perceptible effect on receiver operation.

S_5 is provided to inactivate the monitor if there is any reason to want to operate without it.

Electronic Keying

Addition of the electronic key to the unit was inspired by W5VHO's article² on a transistorized automatic keyer. Its simplicity of design, construction, and operation fitted perfectly with the specifications of our unit. An attempt was made

²QST, April, 1958.

to use transistors to switch the break-in relay directly, and while possible it requires power transistors and introduces some problems of relay adjustment which the addition of a second relay avoids. The relay selected (Advance SVIC4001) is a very sensitive s.p.d.t. unit with adjustable contacts and variable spring tension. One with a 1600-ohm coil was tried and found to limit the current too much when used with a 6-volt supply, although it worked perfectly with 12 volts. The 400-ohm model, which works perfectly on 6 volts, is easily obtainable on special order.

Since the relay operating current runs about 5 ma., it is well within the current-handling capacity of inexpensive transistors such as the CK-722.

Modification of the W5VHO circuit to put the relay in the transistor emitter circuit instead of the collector circuit seems to make cut-off more positive. We don't know why, unless the original circuit had a tendency to be self-biasing.

Rearrangement of the speed control switch S_1 permits use of the fifth position to bypass the electronic key and restore the bug to normal operation with its dot and dash contacts in parallel. Use of a s.p.d.t. switch for S_2 is a safeguard against accidental reversal of transistor polarity. Without the connection it makes when in the OFF position, any accidental grounding of the relay or resistor network with S_1 in position 5 could throw the emitters negative in relation to the bases, under key-up conditions. We think that is what ruined a pair of transistors during our experiments.

Construction

Physical arrangements of the components is a matter of the operator's personal preference. At W8GRG the complete control unit is on a 2 \times 5 \times 7-inch chassis, mounted on end alongside the receiver, just above the key. The b.f.o. monitor tuning slug and output jack are available on the top end of the chassis. The

(Continued on page 170)

A New Material for Ham Construction

Using Printed-Circuit Stock To Replace Sheet Metal

BY CHARLES H. LEIPER,* WHIPV

SOME years ago I spent many hours breadboarding a band-switching amplifier for the lower bands. Once it was completed and on the air I soon found out that it made hardly a dent in the QRM on 80, 40 or 20—so I went v.h.f. As I enjoy building my own gear, the first project was a converter. I made two, neither of which worked as it should have, but from them I learned about such things as short r.f. leads, stray ground paths, the right and wrong in bypassing, the need for adequate shielding, and all the rest.

My next converter started out with a flashing copper base, but I gave up on this when my 100-watt soldering gun gave me nothing but cold solder joints, because of conduction of heat away from the tip. I was about to give up and buy a converter, when a change of jobs introduced me to industrial plastics. One look at some of the parts we fabricate for customers who use printed circuits and I felt that I had my material for v.h.f. converter bases.

My fourth converter effort worked out nicely, and is shown herewith. At first glance it will look very much like many other home-built v.h.f. converters, and it is, circuitwise. There are two grounded-grid r.f. stages, a push-push mixer, and a cathode follower. (The oscillator is on a separate chassis.) Circuit details are not important for the purposes of this discussion; it could be anybody's converter design, a small exciter, or any other piece of ham gear of moderate weight and size. It's the base and shielding ideas that are different.

The main chassis plate and the shield partitions are of $\frac{1}{16}$ -inch Formica, copper clad. This is the same material used for making printed circuits, except that here it is used in its virgin state, without sensitizing or etching. The main base plate is

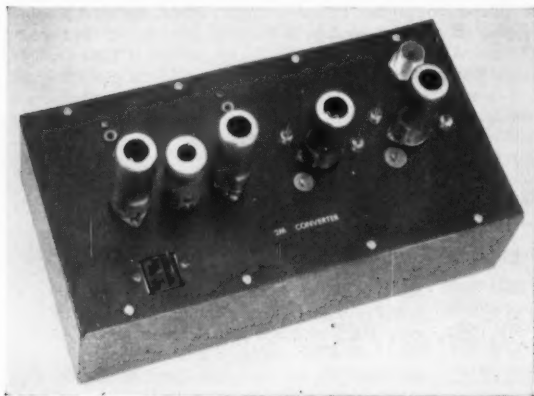
cut to fit a standard chassis, and is used with the copper face down. This leaves a smooth brown surface of attractive appearance for the top. This takes decals readily, and it maintains its neat look indefinitely. The shield assembly is made up by clamping the various pieces in place and soldering them to the base plate, and to each other, as shown. The work on this converter was done with a 25-watt Ungar soldering pencil!

This printed-circuit stock has many advantages in amateur home construction, and particularly for v.h.f. gear, in view of the importance of grounding and shielding in the latter. The copper bonded to the Formica is only .00135 inch thick, but this is adequate for the d.c. ground currents found in equipment of this type. At frequencies from 50 Mc. up, at least, it is several times the depth of "skin effect" penetration. It can be drilled, sawed and filed much more readily than suitable forms of sheet metal, and it has mechanical and electrical possibilities that are limited only by the ingenuity of the user. Here are a few hints.

For feed-through insulation: drill a hole the required size and then scrape away the copper around the edge. Another way to do this is to touch a larger size drill lightly to the copper surface to give a slight countersink effect. For a bypass capacitor, either feed-through or conventional type, all that is needed is a sheet of Teflon or other suitable insulating material, a disk or other shape of the copper-clad stock, and a screw, with nut, washer and soldering lug. See Fig. 1. Interstage shielding has already been described; all you need for this is a soldering iron and a vise or other clamping device. No brackets or drilling are involved.

The advantages are not obtained without some special consideration in working with the new material, but the problems are by no means in-

*Chief Engineer, Fabricon Corporation, 19 Mill St., Unionville, Conn.



A 2-meter converter of conventional design, built by WHIPV, using printed-circuit stock for the base plate. Top surface is brown Formica, which takes decals nicely and retains its neat appearance under hard use.

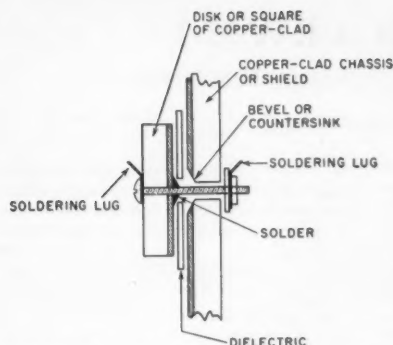


Fig. 1—Method of making a feed-through bypass capacitor using copper-clad printed-circuit stock.

surmountable. In drilling the stock, back it up with a flat board; otherwise there may be a tendency for the material to chip slightly when the drill breaks through. In cutting, use fine-toothed saws. A hacksaw or spiral coping saw works fine. In clamping the stock in a vise use wood blocks to prevent damaging the copper coating or marring the smooth Formica surface. Wire leads may be

soldered directly to the copper surface, but if they are large or stiff wire they should not be bent after soldering in place. If a stiff wire must be reformed, unsolder it from the copper first, otherwise the strength of the bond between the copper and phenolic plastic may be exceeded and the copper coating will tear away.

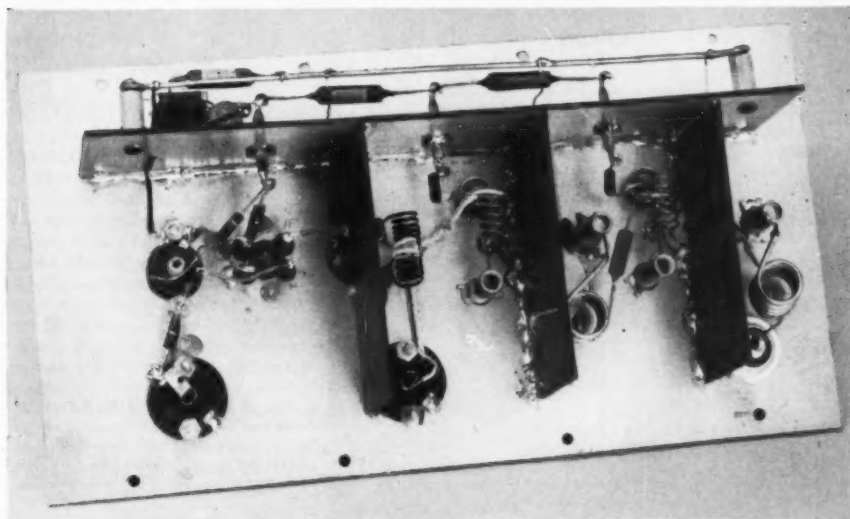
The material is normally available only in sheets 36 by 42 inches in size. This is probably larger than most amateurs will require at any one time, so arrangements have been made to supply sheets 14 by 18 inches in size through a local radio distributor. Sheets are available in $\frac{1}{16}$ -, $\frac{3}{32}$ -, and $\frac{1}{8}$ -inch thickness. Prices for the $\frac{1}{16}$ -inch stock, the thickness that would normally be used for base plates and small construction work, are closely comparable with those for aluminum sheet.¹

Sheets are supplied with a peel-off protective coating, to prevent oxidation. When this is removed the copper surface may be given a coating of Krylon spray, to prevent finger marks. This has no effect on the ease of soldering, and no scraping or cleaning of the Krylon-treated surface is required.

QST

¹ 14 X 18-inch sheets are \$2.56 in 1/16-inch stock, \$3.35 in 3/32-inch and \$4.10 in 1/8-inch, plus postage from Hartford, Conn. Inquiries to the author will be forwarded. Shipment is made on a cash-with-order basis only.

Bottom view of the converter, showing base plate and shield partitions made of printed-circuit stock. Soldering operations can be handled with the smallest type of soldering pencil or gun. No mounting brackets or soldering lugs are needed.



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75 Meters with a KWM-1

Modifications for Low-Frequency Operation

BY JOHN ENGLESTED,* W1VLN

If you are the owner of a KWM-1 and would like to modify it for 75-meter operation (without changing its performance on 20, 15 and 10, of course), this article is your meat. But even if you don't have one of these compact sideband stations, you just may get some ideas from W1VLN's description of how he tackled the job.

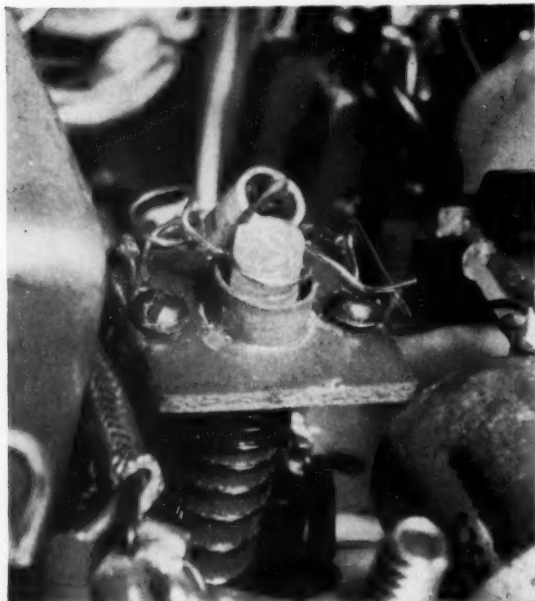
THE Collins KWM-1 has been in business on the amateur bands for over a year now and is obviously a tremendous success, as the vast majority of mobile single-sideband signals emanate from such installations, and hundreds more from home stations can be heard on 10, 15 and 20 meters. There is no doubt that this well-designed and compact piece of equipment has revolutionized the concept of what it takes to make a ham radio station. Probably the one thing that has kept more hams from being completely enthusiastic about this unit is the fact that no provision was made for 75- or 40-meter operation. Last summer, when 10 and 15 meters were out for long periods of time, this became particularly

* West Road, Petersham, Mass.

annoying, because 20 meters was then so overcrowded that often it was not too useful either. This prompted the author to look into the possibility of including at least one of the lower-frequency bands.

Possibly the Collins engineers had some such thought in mind when they originally designed the circuit. The tunable i.f. of the receiver portion covers 3.9 to 4.0 Mc., and on transmit the lower sideband is passed through this same frequency range. After a little study it became apparent that if the antenna could be coupled to this portion during receive, and if this and the (retuned) output 6146s could be used on transmit, the problem would be solved. A further condition we set for the modification was that no new panel controls would be added. It took quite a bit of study and experimentation and back tracking, and about 10 hours of production time, to put the KWM-1 on the top 100 kc. of 75.

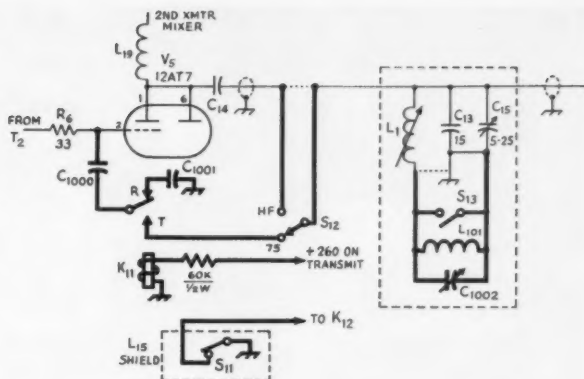
The operation of the converted KWM-1 on 75 meters is identical to that on the three higher-frequency bands, except that the 0 position on the dial corresponds to 4.0 Mc. and 100 corresponds to 3.9 Mc. In other words, the dial reads "down" rather than "up," but actually this is not the hardship it was anticipated it might be. The dial reading shows how far the set is from the high-frequency end, which is just as satisfac-



A view of the bottom of the "KWM-2" shows that switches that are actuated by the coil tuning slugs have been added to several of the coil assemblies. For this photograph, one shield can was removed.

Fig. 1—Circuit changes at the second transmitter mixer to extend KWM-1 range to 75 meters. The heavy lines indicate new circuitry and components; the dotted lines represent former wiring. Switches and relays are shown in receive and 75-meter position.

The "+260 on transmit" can be picked up at the junction of C_{187} and K_2 (Collins designation).



C_{1000} —470 μ mf. mica.

C_{1001} —25- μ mf. silver mica.

C_{1002} —8- to 50- μ mf. ceramic trimmer (Erie 557 or Centralab 822).

K_{11} —Shielded s.p.d.t. relay, 10,000-ohm 2.7-ma. coil (Potter & Brumfield SM5LS).

L_{101} —15 μ h. (National Blue Chip MIL Inductance B15977).

S_{11} , S_{12} , S_{13} —Homemade switches actuated by exciter tune control. See text and Fig. 4.

tory as the reverse would be. Actually, frequency can be calculated very quickly, after a few hours' practice. Lower sideband is automatically produced when switching to 75 meters, and both the tuning of the signals and the relative spread are just about the same as on any of the other bands.

To accomplish the band change without adding panel controls, several switches were added that cut out (or in) as the exciter tune control is set to the low-frequency end of its travel (14.0 Mc.). These switches allow inductance and capacitance to be added to the pertinent circuits, and through their control of relays they modify mixer circuitry and change the transmitter output circuit from an L network to a hybrid pi. The tuning of the output tank then becomes very similar to the tuning on the higher frequencies, except that all of the tuning is done with the right-hand roller coil, with the left-hand coil at maximum inductance. The pi network is designed to work into a fixed load of 52 ohms. To go to 75 meters, it is not necessary to select a particular crystal, and the crystal switch can be left in any position.

Circuit Changes

Referring to Fig. 1, it is necessary to jump the second transmitter mixer, V_5 , during 75-meter transmit operation. This is done through a switch S_{12} and a new relay K_{11} which closes during transmit. (Switches S_{11} , S_{12} and S_{13} are actuated by the exciter tune control setting, as mentioned earlier.) Switch S_{12} opens the original circuit so that V_5 will be bypassed during 75-meter operation, and S_{13} cuts in an additional inductor and trimmer to load the original tuned circuit to 3.95 Mc., the center of the signal-frequency band. The tuned circuits associated with coils L_8 and L_{18} are switched and tuned similarly, except that the circuits are maintained above d.c. ground, as shown in Fig. 2.

To change over the 6146 output circuit, a d.p.d.t. relay is required. A triple-pole double-throw relay is shown in Fig. 3; it was done this way in our particular installation because the third pole was used to control an external antenna relay. The two essential poles switch in padding capacitors that convert the L network to a pi and, as mentioned earlier, the tuning is done with L_{12} , with L_{11} set at maximum inductance. Although the Q turns out to be a little high with the values shown, no trouble has been experienced with the roller coils or other components.

Construction

The switches S_{11} , S_{13} , S_{14} and S_{15} (not shown)

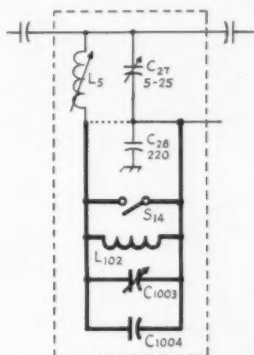


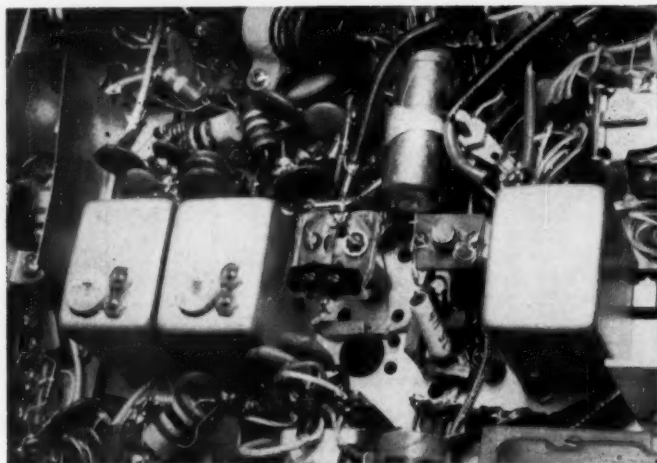
Fig. 2—Circuit modifications for L_5 (and L_8). Heavy lines indicate new circuitry and components; dotted line represents former wiring.

C_{1003} —8- to 50- μ mf. ceramic trimmer (Erie 557 or Centralab 822).

C_{1004} —50- μ mf. silver mica.

L_{102} —15 μ h. (National Blue Chip MIL Inductance B15977).

S_{14} —Homemade switch actuated by exciter tune control. See text and Fig. 4.



The shielded relay (K_{11} in Fig. 1) is mounted horizontally with its base near the socket for V_5 (Collins designation). Held in place by a clamp, it can be seen near the top center of this picture.

are mounted in the cans for L_{15} , L_1 , L_5 and L_8 (not shown), respectively. There is room on the chassis between the shields for L_1 and L_5 to mount the switch S_{12} , where it, too, can be actuated by the exciter tune control through a dummy coil form and slug.

Details of the switch construction are given in Fig. 4. A plastic shelf is cemented to the coil form, and the threaded plastic plug is adjusted with a screwdriver so that the switch just opens (or closes, in the case of S_{11}), when the exciter tune control is set at the low-frequency end of its range.

The associated trimmer capacitors (as, e.g., C_{1002} with S_{13}) are mounted in the tops of the shield cans housing the switches and coils. In L_1 the rotor of the capacitor is grounded to the can, and the stator is connected with a length of wire to the proper place in the circuit. The can is replaced, taking a little care to see that the wire to the trimmer is dressed properly inside the can. While this may seem like a haphazard method, no trouble has been experienced. In L_5 and L_8 it is necessary to run two leads from the capacitor,

since the rotor is not grounded; this is illustrated in Fig. 2.

In the plate circuit of the 6146 transmitter output stage, the Potter & Brumfield relay mounts on the side of the antenna-coil compartment without drilling a hole; the mounting stud of the relay will fit in a convenient ventilation hole after the hole has been reamed out slightly. There is also room in the antenna-coil compartment for C_{1008} and C_{1009} near the rear wall. The ceramic capacitors, C_{1005} , C_{1006} and C_{1007} , were wired together and supported by the lead between C_{40} , C_{42} and L_{10} (Collins designation — see Fig. 3).

Operation

Currently there is only one antenna on the car, and there is the minor annoyance of getting out of the car to slide up the Slim Jim antenna to the 75-meter position when going from high-frequency operation. Our present thinking involves the use of two whips, one for 75 and one for the high-frequency range, with the third circuit on K_{12} (Fig. 3) controlling the antenna

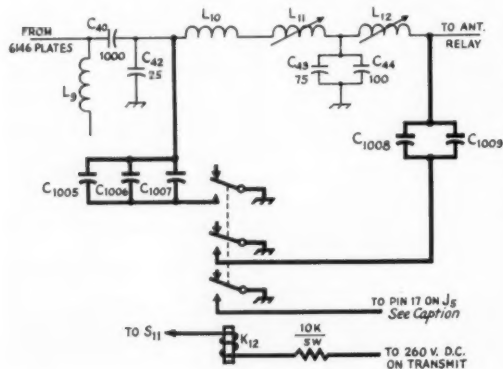


Fig. 3—Circuit changes in the 6146 plate circuit. Heavy lines represent new circuitry and components.

C_{1005} , C_{1006} , C_{1007} —100- μ mf. ceramic, 5000 volts (Centralab 850S-100N).

C_{1008} —1500- μ mf. silver mica.

C_{1009} —300- μ mf. silver mica.

K_{12} —Triple-pole double-throw 110-v. d.c. relay (Potter & Brumfield KA14D 110 v. d.c.). Lead to Pin 17 on J_5 required only if 75-meter antenna switchover circuit is desired. If lead is connected to Pin 17, lead from S_5 to Terminal 17 should be disconnected.

The output circuit relay (K_{12} in Fig. 3) is mounted in the antenna-coil compartment at the left. Output capacitors are also mounted in this compartment (visible just above the hinge); the trio of ceramic capacitors in the center are the input capacitors.

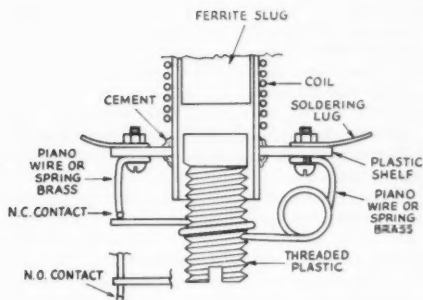
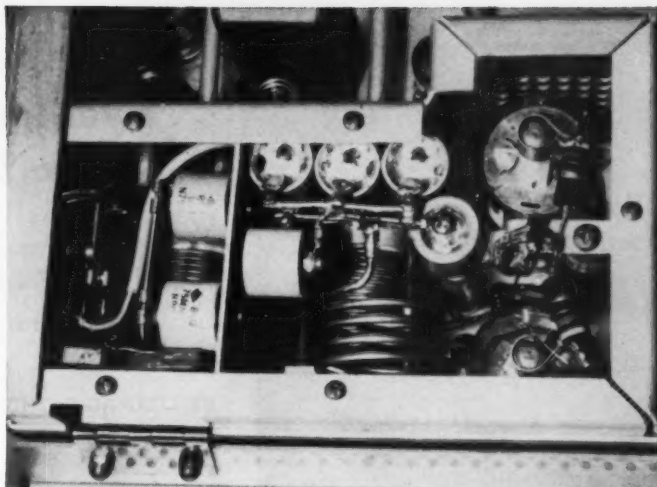


Fig. 4—Details of the switches. When the ferrite tuning slugs move all the way in, at the low-frequency end of the tuning range, they actuate the threaded-plastic slugs and open the switches. The normally-open switch, S_{11} , requires a minor modification of the contact arrangement, as shown.

The switches are adjusted by the positioning of the plastic slugs and the "springiness" of the loops.

changeover relay. But for the time being the "KWM-2" does quite well with the present antenna system.

The "KWM-2" was first tested at home on a regular 75-meter antenna. Results were extremely satisfactory, as the receiver portion performed equally as well as a comparison 75A-4 within the same limitations as would apply to the three higher-frequency bands. Similarly, the transmitter portion of the new unit lived up to our fondest hopes. The "KWM-2" was then installed in the car and has been operating since early winter with very gratifying results. The limitations of using a base-loaded 8-foot whip for 75-meter radiation were not as severe as anticipated, and when there is any activity at all it is possible to make some satisfactory 75-meter contacts under even the worst band conditions.

Operation during the past months has demonstrated that 75-meter mobile sideband operation is very practical. Several years ago the author gave up 75-meter mobile a.m. operation, as the results were never worth it. However, the use of mobile s.s.b. more than justifies the effort. **QST**

Strays

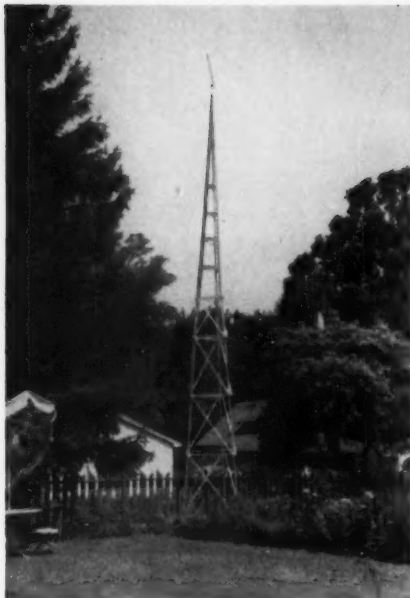
The Missile Amateur Radio Club of the Vandenberg Air Force Base, California, has a sub-assembly known as the Guided Hams of Outer Space Telegraphy Society (GHOSTS). The GHOSTS are amateurs who are primarily connected with the operation, maintenance or support of any military guided missile program.

K5EYZ, who has just received his General class ticket, says that as far as he is concerned life begins not at 40 but at 77. (Cause that's how old he is.)

Another long-winded QSO — K2MUB and K2RHH for 35½ hours on 50 Mc. — K2ZSQ.

Coincidence? W6RFD is named Henry while K6RFD is named Coulombe.

W2EYG, who operates 80 and 40, phone and c.w., would like QSOs with other members of public school boards of education.



Here's a small tower that can be built in a week end with not much more than a saw and hammer. It will carry a small beam without guying.

AFTER deliberately ignoring for several years a crooked two-by-four pole holding up one end of our 40-and-80 skywire, we (the jr. op, W7JHS, and myself) decided to build something which would integrate itself with the landscape in a more pleasing manner. Incidentally, there was practically no QRM from the XYL on the matter.

Guy wires were out of the question because we would have to obtain permission from two neighbors to anchor them on adjacent property. So we settled for the 32-foot self-supporting wooden tower shown in the photographs and sketches. It is triangular and is fabricated from 2×2 s and 1×2 s (S4S pine). All truss members are formed from 1×2 pine. The bottom sixteen-foot section of the tower is built with the 2×2 stock for vertical members and the top half is reduced to the 1×2 stock. The tower is extremely light and rigid and can easily be lifted off the ground by one man as seen in one of the photos. Incidentally, the tower is being held at its center of gravity, slightly below the mid-point of the tower. This low center of gravity is one reason the whole business can easily be pushed up by one man.

The site of our tower is one corner of the lot, in the angle formed by a property-line fence. The

*1124 Fifth St., Prosser, Wash.

Self-Supporting Tower for Small Back Yards

*A 32-Footer for
Less Than \$20.00*

BY CORMAC C. THOMPSON,* W7ACA

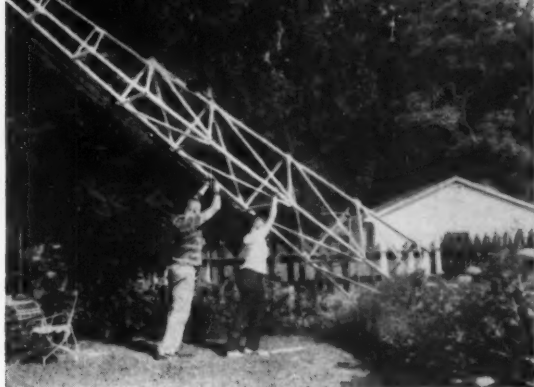
front legs are nailed or bolted to a 2×6 which diagonally crosses the fence corner and the rear leg is secured to the top rails of the fence. Thus the fence forms a stable and secure ground anchorage for the tower and serves to tie it in with the rest of the landscaping. As seen from the photo the shrub border at the rear of the lot satisfactorily hides the base of the tower in a pleasing manner.

The photographs and sketches of Fig. 1 show the details of construction. All joints and splices were made using galvanized nails with cement-coated, serrated nails being used in the proportion of one to three. We completely painted the tower with one quart of aluminum paint, brushed on, with liberal application at the joints.



"The tower . . . can easily be lifted off the ground by one man. . . ."

"The heavy lugging comes from the ground level up to the 45-degree angle."



The complete cost of material is itemized below:

Three	2 × 2 × 16	at 10¢ per l.f.	\$ 4.80
Three	1 × 2 × 18	at 5¢ " "	2.70
One	2 × 2 × 8	at 10¢ " "	.80
115 lin. feet of	1 × 2	at 5¢ " "	5.75
2 Awning pulleys		at 35¢	.70
1 Quart aluminum paint			1.80
			<hr/> \$16.55

This amounts to just about 50 cents per foot.

The construction and painting of the tower consumed less than eight hours. Erection took just a few minutes. We first nailed the diagonal 2 × 6 across the fence corner, placed the tower

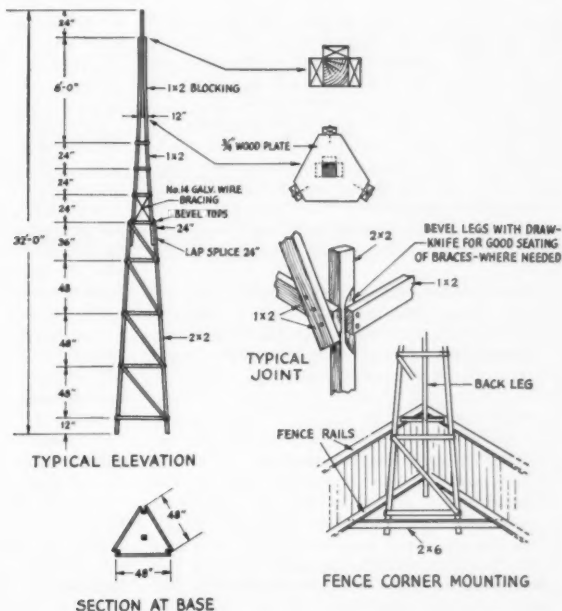
on it and tied the legs to the 2 × 6 to keep the base in place while we pushed it up. The heavy lugging comes from the ground level up to the 45-degree angle. From then on, the center of gravity starts to swing in toward the base and it's duck soup.

We are thinking about building another one. There is something highly satisfying about backing off and contemplating a structure which stands there and holds itself up. Besides, there are no guy wires with loose or corroded contacts giving birth to spurious r.f., or lying in wait to tear an ear off when you chase the neighbor's cat out of the flower garden.

This thing will hold up a small beam if you want it to.

QST

Fig. 1—Constructional details of the 32-foot mast designed and built by W7ACA and W7JHS.



A Transistor Transmitter for 50 Mc.

50-Mc. Operation with Inexpensive 10-Mc. Transistors

BY L. U. KIBLER,* K2MSU

THOUGH prices are slowly coming down, transistors designed to operate in the v.h.f. range are still fairly expensive. There are features of lower-frequency transistors which can be utilized to overcome the cost problem, at least at 50 Mc. It is the purpose of this article to point out these features, and to describe a transmitter operating at 50 Mc. using 30-Mc. transistors that sell for about \$3.00 each.

A transistor is characterized at high frequencies by its alpha (α) cutoff frequency. This is the frequency at which α is down 3 db. from the low-frequency value. For frequencies greater than this, α , and hence the gain, falls off at approximately 3 db. per octave.

To operate in the v.h.f. range with lower-frequency transistors, we seek an inexpensive transistor whose gain at the cutoff frequency is such that at the frequency at which we desire to operate there is still sufficient gain. The 2N247 transistor fills these requirements. The cutoff frequency is 30 Mc. and the common emitter power gain at 11 Mc. is 24 db. If we consider that this gain falls off at 3 db. per octave (a bit pessimistic) we have a power gain of about 17 db at 50 Mc. This is a gain of about 50. The 2N247 also fills the second requirement in that it costs about \$3.00 at present. This transistor also has the advantage that it will dissipate 35 milliwatts, and it has a maximum collector voltage of 35.

A transmitter using four 2N247 transistors in the r.f. section and two CK722 transistors in the modulator was designed using the above principle. The r.f. transistors are operated in the common-base connection. The type of d.c. bias used in all circuits provides maximum temperature stabilization. The circuit diagram is shown in Fig. 1.

The oscillator uses a 50-Mc. International Crystal Co. crystal in a series-tuned feedback circuit between the collector and the emitter of the first 2N247. RFC₁ keeps the emitter above r.f. ground. Several combinations of capacitor and r.f. choke will work; however, one combination will be optimum for the particular transistor used. Individual experimentation may be necessary for the most efficient operation.

The second transistor serves as a buffer to the oscillator and a driver for the final amplifier. It is coupled to the oscillator tank coil by L_3 . L_1 and L_2 are placed parallel to each other and about $\frac{3}{8}$ inch apart. One to three turns of fine wire (about No. 27) wound about both coils will

provide sufficient coupling. The coupling to the final involves a bit of adjustment. L_5 is placed about $\frac{1}{8}$ of the way into and in the center of L_4 . Small variations of this position are necessary to provide the best coupling to the final.

The final amplifier uses two 2N247s in push-pull. A small amount of forward emitter bias is provided for both transistors by the 7500- and 100-ohm resistors in series. Without drive about 100 microamperes or less collector current flows. With drive the collector current is 6 to 10 ma. depending on the drive and the activity of the final transistors. The output coupling coil, L_7 , is coupled to the center of L_6 and for a 50-ohm load about one half the way into it.

The tuning procedure is somewhat different from that for the usual transmitter. The r.f. voltage across the various tank circuits is observed with the aid of an r.f. probe and a vacuum-tube voltmeter. (A Heathkit r.f. probe is satisfactory.) The final transistors should be removed during the initial tuning of the oscillator and the buffer. When tuning the final it is necessary to terminate the output coil, L_7 , with a 50-ohm or 75-ohm resistor. One-half watt carbon resistors are adequate. *Unloaded operation of the final can result in r.f. voltages across the collector that are in excess of the 35-volt collector-to-emitter breakdown voltage, and may produce a permanent short between these terminals of the transistor.*

Some 2N247s will be more efficient and give higher output than others. Twelve transistors were tried in this circuit. The minimum output power, as delivered to a 50-ohm precision resistor, was 32 milliwatts and the maximum power was 65 milliwatts. It is suggested that the transistors be switched about in the circuit until the most efficient pair is in the final. All 2N247s will operate well in the oscillator and the buffer.

The modulator is a simple two-stage transformer-coupled amplifier. Transistors are operated in the common-emitter connection. D.c. temperature stabilization is used in the bias arrangement. The potentiometer is included between the two stages to allow adjustment of the modulation level at the r.f. final. There is sufficient gain to allow the use of a crystal microphone. A cheap (\$1.75) crystal microphone was used, and while the audio quality was not the best, it is adequate for voice.

The physical layout is not critical, but good v.h.f. practices such as short leads and shielding between the input and the output of the final should be observed.

*R.D. 1, Box 506-7, Red Bank, N. J.

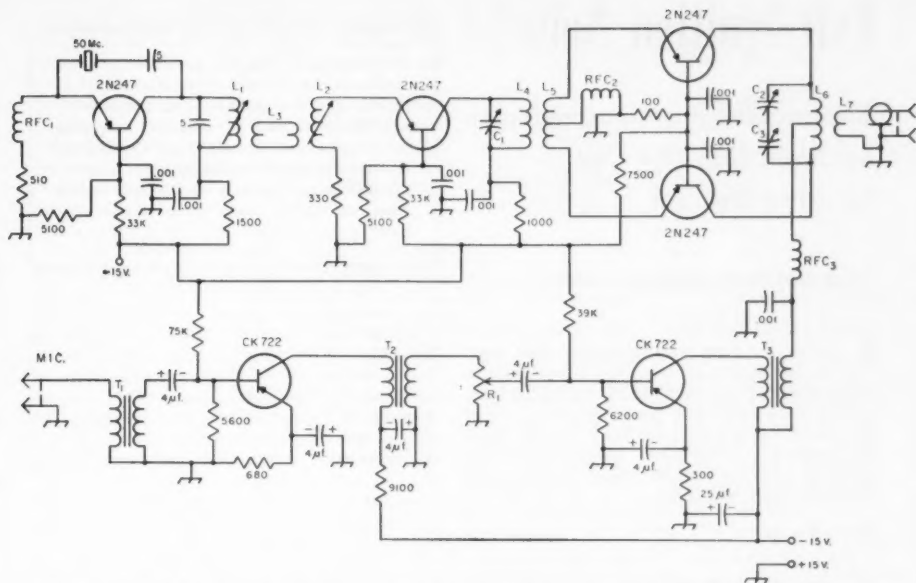


Fig. 1—Schematic diagram and parts information for the 50-Mc. transistor transmitter. All resistors may be the smallest available type. Capacitors below .001 μ f. are in μ f.

C₁, C₂, C₃—7–45- μ f. ceramic trimmer.

L₁, L₂—Slug-tuned coil, 0.48 to 0.92 μ h.

L₃—3 turns No. 27 enamel at each end, inserted between turns of L₁ and L₂.

L₄—10 turns No. 18 tinned, 1/2-inch diam., 3/8 inch long.

L₅, L₇—4 turns No. 18 enamel, 1/2-inch diam., spaced wire diam.

L₆—13 turns No. 18 tinned, 1/2-inch diam., 1 inch long.

R₁—10,000-ohm potentiometer.

RFC₁—2.5-mh. r.f. choke.

RFC₂, RFC₃—7- μ h. v.h.f. choke (Ohmite Z-50).

T₁—Microphone transformer (Argonne AR-144).

T₂—Interstage transformer (Stancor SSO-3).

T₃—Modulation transformer (Argonne AR-108).

The total power consumption of the transmitter is 23 to 28 ma. at 15 volts. Two units have been operated successfully. Consistent contacts have been made at 15 miles using a 5-element beam 35 feet high. Stations as much as 50 miles away have been worked, with signal reports of S5.

Some consideration has been given to using this transmitter in a transceiver. To this end some work is proceeding on the design of a superregenerative receiver and a short 6-meter helical whip. Results of this work may be commented on in the future.

QST

Strays

Here are the May schedules for the various MARS technical nets.

First Army MARS

(Wednesday evenings 2100 EDT, 4030 kc., upper sideband)

May 6—American Antarctic Communications Adventures.

May 13—Telemetry for Guided Missiles.

May 20—The Megacoder.

May 27—Novel Tuning Methods at U.H.F. and Lower Microwave Frequencies.

AF—MARS Eastern

(Sundays 1400 EDT, 3295, 7540 and 15,715 kc.)

May 3—R.F. and X-Ray Measurement in the Field.

May 10—Microwave Communications Systems

May 17—Basic Transformer Theory.

May 24—Basic A.C. Systems.

May 31—Crystal Control and Adjustments to Quartz Crystals.

AF—MARS Western

(Sundays 1400 PST, 7832.5, 3295, 143,460 kc.)

May 3—Organization Facilities and Operation of a Modern Communication System.

May 10—Wide Band Microwave Telemetry.

May 17—High-Impedance Modulation Systems for Klystrons.

May 24—Electronics in Medicine.

May 31—Equipment Utilization and Conversion.

Exit Ignition Noise!

Eliminating Automotive Noise by Shielding the Car Ignition System

BY E. LAIRD CAMPBELL,* WICUT

LIKE "death and taxes," automobile ignition noise¹ has been with the mobile ham since he first took to wheels. He has been able to clip it, limit it, suppress it and has sometimes tried to overlook it, but rarely has he completely cured it. It seems that no matter how carefully leads are by-passed, body joints bonded, resistance inserted, or traps installed, there is always at least some noise remaining.

What To Do?

The author tried all of these methods to suppress noise and many others, too on his 1956 Ford V8, but they just didn't satisfy because of that last remaining bit of noise that prevented hearing the weak ones. Since none of the usual methods completely cured the noise, a new way had to be found for making mobile operating what it could be at its very best.

Why not bottle up the entire ignition system? If the noise source were completely shielded there would be no need for the usual bonding and bypassing, because the noise wouldn't get out to contaminate the remaining electrical system. KICJX, a licensed aircraft engine mechanic, advised that it is common practice to shield the ignition systems of aircraft. If it could be done in an airplane it ought to be equally successful in a car, so shielding of the ignition system of my car was undertaken.

Before describing the project, here is a little background which may help in understanding the shielding approach to noise elimination.

Ignition Noise

Most automotive noise is generated and radiated by the ignition system—that is, the distributor, high-voltage coil, spark plugs, and interconnecting leads. A diagram of an ignition system is shown in Fig. 1. You can think of the ignition system as a spark transmitter with plenty of radiation throughout the radio spectrum. When the coil primary circuit is interrupted by the breaker points, the high voltage induced in the secondary causes a spark to jump the gap in the spark plug, emitting high-frequency electrical energy. The sparks at the breaker points and

* Technical Assistant, QST.

¹ That is, noise arising in the ignition system alone—not including noise originating in such auxiliary electrical-system equipment as the generator, regulator, gauges, and similar devices.

Sometimes a lesson learned in one field can be turned to good account in another. What we know about shielding for TVI can be applied usefully to getting rid of the last vestige of ignition noise in a mobile installation. If you want mobile reception really free of QRN from your own car, here's how to get it.

plugs are sources of radio energy that make up the high-amplitude ignition pulse noise familiar to all mobile hams. Resistor spark plugs, or resistance in the high-voltage circuit, will attenuate the h.f. oscillations from the spark discharge and thus reduce ignition noise. Mobile operators using resistor plugs have reported noise

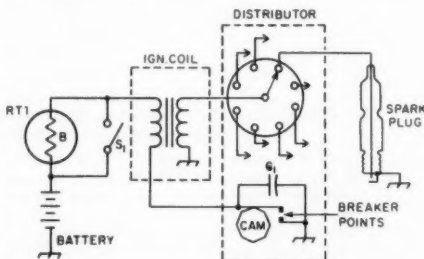


Fig. 1—Schematic diagram of the ignition system. RT₁ is ballast resistance in series with the ignition coil primary. When the engine is started the ballast is temporarily bypassed by switch S₁ and full primary voltage is applied to the coil. C₁ is the ignition capacitor.

reductions of 10 to 80 per cent, depending upon the automobile, operating frequency, and type of equipment. (By the way, spark plug manufacturers claim resistor spark plugs are not harmful in any way to the operation and performance of the engine.)

Other Noise Sources

Before describing methods of shielding ignition systems, it should be mentioned that there are several other sources of noise in the car—generator, voltage regulator, wheels, and gauges, to name a few. Conventional suppression methods will usually clean up this noise.² In the case of generator noise, a 0.5- μ f. coaxial feed-through capacitor with appropriate current rating, connected to the generator armature terminal, usually will suffice. In cases of extremely bad generator noise, a trap consisting of a tuned circuit at the operating frequency of the mobile station should be connected in series with the generator armature.

² Short, "Automotive Radio Noise Elimination," QST, April, 1952, p. 17.

Voltage-regulator noise can be suppressed by using coaxial feed-through capacitors connected as shown in Fig. 2. Two 0.1- μ f. capacitors are used. One is connected to the terminal marked "armature" and the other to the regulator "battery" terminal. A third capacitor, which can be a 0.002 μ f. mica, bypasses the "field" terminal to ground. The 4-ohm resistor in series with the capacitor is absolutely necessary when connecting a capacitance across the field, to protect the regulator contacts.

Tire and wheel static usually can be eliminated by using static-collector rings between the wheel hub cap and front axle. These rings are sold by most auto dealers. Antistatic powder can also be injected into the tire tubes. This powder is conductive and provides a bleed-off path for the static charge.

Gauge noise can be suppressed by bypassing the gauge terminals at the gauge itself. Most late-model cars come equipped with these devices already bypassed.

The coaxial feed-through capacitors mentioned above are made by most capacitor manufacturers, and are designed to have very low in-

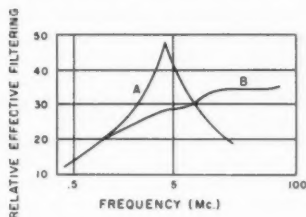


Fig. 3—Curve showing relative effective filtering from (A) conventional capacitor and (B) coaxial feed-through capacitor.

ductance; thus they are very effective over a wide frequency range. The graph in Fig. 3 illustrates the effective filtering action of a conventional capacitor A, compared with one of coaxial construction, B. The conventional capacitor has a limited range of filtering usefulness.

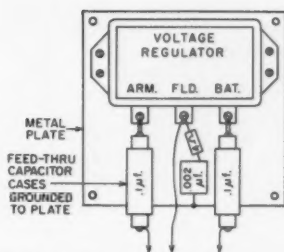


Fig. 2—Sketch showing connection of noise suppressors to the voltage regulator. The 0.1- μ f. capacitors are of the coaxial feed-through type.

The First Experimental Model

Once the sources of noise mentioned above have been treated by the methods described, there is still the pulse-type ignition noise, and with it the reason for shielding. Bottling up the ignition system can be compared to TVI harmonic suppression in a transmitter. Every joint, hole, crack and crevice must be electrically tight. Even a small break in the noise armor will render the system useless. The high-voltage coil, the distributor, spark plugs, and interconnecting wiring must all be enclosed in the shield. All leads leaving the shield must be bypassed in order to complete the screen around the system.

Our first experimental shielded harness, dubbed the "milking machine," is shown in Fig. 4. Constructed in a few hours, it consisted of four main parts: the distributor shield, the high-voltage coil shield, spark-plug shields, and the shielded ignition wire. The distributor and coil covers were tin cans that fitted snugly over these components. A few suspicious looks came our way while we ambled up and down the aisles of a local supermarket with the coil and distributor in one hand, sampling tin-can sizes with the other! The coil cover was clamped over the end of the high-voltage coil, which was first scraped clean of all paint and grease. The two primary leads leaving the can were bypassed with coaxial capacitors. A peanut can made a tight fit over



Fig. 4—The "milking machine" was the first experimental model of the shielded harness. Spark plugs were covered by the open-end tubes and the shielded braid was bolted to the car ground. A peanut can shielded the distributor, and a glue-can shield, at the left, was clamped to the end of the ignition coil.

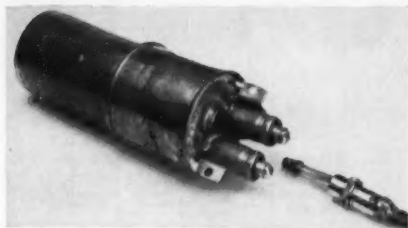


Fig. 5—Shielded ignition coil. Coaxial feed-through capacitors are soldered to the can, which is then soldered to the coil. The open hole is for the high-voltage lead at the right.

the distributor cap. Holes were drilled in the top of this can to allow the knobs on the distributor cap to pass through. Four small strips of shim stock were soldered to the lower lip of the can. When the shielded distributor cap was mounted, the shims were bent around the bottom of the cap so that electrical connection would be made between the shield and the engine. RG-8 U coaxial cable was used for the high-voltage leads and there was no trouble with voltage breakdown. Sections of brass plumbing pipe covered the spark plugs. The RG-8 U outer shield was soldered to one end of each pipe, and a length of shield braid was soldered to each pipe and grounded to the engine block. This completed the harness, which was then mounted in the car.

Results of the first test were encouraging. There was a definite improvement. Nevertheless, there was still a slight trace of noise. It had to be coming from the ignition system because all other sources had previously been treated. Further experimentation indicated that the weak link was the method of shielding the spark plugs. Even though the plugs were covered by brass pipe, the open ends of the pipes permitted noise to escape.

K1CJX suggested using shielded aircraft spark plugs, which come in a variety of thread sizes. These plugs were obtained, and although the threads fitted perfectly they wouldn't screw in all the way, unfortunately, because of interference with the spark plug well on the engine block. To overcome this the plugs were turned down on a lathe to reduce their diameter, and the hex shoulder used for tightening the plugs was also removed. After this they could be screwed in all the way and tightened by hand.

The second test was then made. The result: absolutely no trace of ignition noise! Mobile reception could now compare with reception at a home station.

The installation was made semipermanent in order to road-test it and see how it would stand the rigors of moisture, heat and vibration. Then after a few thousand miles of use the shielded system was removed and inspected. (The original distributor cap and cables had been pushed aside for the test, and were easily reconnected when the shielded harness was removed.) But it took almost a whole day to remove the aircraft spark

plugs since there was no way to grasp them with a wrench. Finally, after using a special tool loaned by WIVON, the plugs were extracted. The harness was in excellent shape. The coax didn't show any signs of voltage breakdown, the breaker points in the distributor apparently weren't affected by the added shunt capacitance of the bypass, and the tin-can shield caps were in good condition.

The only thing remaining to make the system foolproof was to find a solution to the spark-plug question. A little research at local spark-plug agencies revealed that a shielded spark plug was available in both the standard and resistor type. Designed primarily for marine installation, these shielded plugs are interchangeable with the unshielded variety provided the additional height doesn't create a clearance problem. Models are available to fit all cars, and are generally carried in stock by marine supply houses. Ordinary automotive-supply sources may not stock them, but can get them for you within a reasonably short time.

The Finished Shielded Harness

Once it had been determined that all the components for the shielded harness could be obtained, a final model was designed. Instead of using RG-8 U cable, which was rather bulky and difficult to dress around engine components, standard unshielded ignition wire (Belden 7766) was covered with copper braid (Belden 8661). Shielded ignition cable is available from aircraft parts distributors but is quite a bit more expensive than the homemade cable.

For those who wish to duplicate the shielded harness, here is a breakdown of the ignition components and a description of the shielding methods:

The High-Voltage Coil

Fig. 5 shows the finished shielded coil. All the paint and grease are removed from the coil case with acetone. The tin-can cover (a Weldwood Glue can fitted our coil perfectly) is drilled so that the two 0.1- μ f. feed-through capacitors (Sprague 80P3) can be mounted and soldered as shown in the photograph. Don't let this extra capacitance across the breaker points worry you; the average value for distributor capacitors runs from 0.2 to 0.3 μ f., so the added 0.1 μ f. won't affect distributor performance.

One might ask if it is necessary to bypass both primary leads coming from the coil since one lead is at ground potential when the breaker points are closed. The answer is emphatically YES! An earlier experiment proved that if the ground side is not bypassed, the noise rises to the original objectionable level.

A third hole is drilled in the can so that the high-voltage lead can be passed through. The plastic center of a female microphone chassis connector (Amphenol 91-PC4F) is drilled out and the fitting is mounted in the hole. The mate to this fitting (Amphenol 91-MC3M) is also drilled out and connected to the high-voltage lead as shown in the photograph. The shielded con-

ductor is soldered to the fitting and the insulated ignition cable passes through the center. This provides an r.f.-tight connection but allows for easy disassembly.

Before the shield can is soldered to the coil, leads should be connected between the capacitors and the primary voltage terminals on the coil. These leads should be tucked in when the can is placed over the end of the coil. Be sure to line up the high-voltage connector on the coil with the hole in the shield can. Solder the can to the coil. A 100-watt or larger soldering iron can handle the job.

The Distributor

The distributor is already partially shielded since the lower part of the container is a metal cup connected to the engine block. The only electrical opening is the plastic cap which contains the sockets for the leads that come from the high-voltage coil and the various spark plugs. Fig. 6 illustrates the shielded distributor cap. It's a good idea to purchase a new plastic cap and leave the present cap, along with its cables, in the engine so it can be used again if the shielded harness is removed. A tin can (a Planter's Peanut can fitted our distributor cap) is drilled so that the knobs protruding from the cap can pass through. Holes are made in the sides so the clips that normally hold the cap in place can be used. Four small strips of shim stock are soldered to the can lip as shown in the photograph. These complete the electrical connection between the cap and the distributor housing. Insert the plastic distributor cap in the can with all the connector knobs protruding through the top of the can. The cables, which have fittings normally used for this connection attached, are inserted into the proper receptacle and pushed in until they are seated correctly. The outside shields from each cable then are worked down around the outsides of the plastic knobs until they make a complete electrical seal. When in place, solder the shields to the can. It's a good idea to strengthen the shield with solder up to about one inch above the junction. If the plastic cap is removed from the can the shield will then retain the proper shape to accept the cap when it is reinserted.

Cables and Fittings

The shielded spark plugs mentioned earlier require special fittings in order to mate with the shielded ignition cable. Fig. 7 shows the fittings required to make up the spark-plug connectors. First come the ceramic sleeves and spring (these assemblies are sometimes called "cigarettes"), which can be purchased from most spark-plug distributors. Next comes the washer — really two washers soldered together — with the cable shield sandwiched between them. Finally there is the threaded cap, which can be purchased along with the other components. In assembly, the ignition cable passes down through the ceramic sleeve and is soldered to the small spring. The end of the shield passes through the hole of the first washer where it is clamped by the



Fig. 6—Close-up of the shielded distributor cap assembly. Note the shims soldered to the underside lip of the distributor cap cover.

other washer and soldered. When the threaded cap is screwed onto the spark plug, it presses against the washers and completes the connection between the cable shield and spark plug.

Final Assembly and Installation

Final assembly of the harness includes cutting the cable to the proper lengths, connecting the spark-plug fittings to the shielded high-voltage cable, and soldering the cable shield to the distributor shield can. Electrical continuity throughout the entire system should be checked with an ohmmeter. The paths between the shielded cans, the high-voltage cable shields, the coil case, and engine ground should all be checked.

The easiest way to install the shielded system is to assemble the harness first on the workbench and then drop it on the engine in one piece. Actual installation should take only a few minutes. The existing unshielded system (distributor cap and high-voltage wires) can be pushed aside and tied down. If it is necessary to remove the shielded harness, the old system can be returned to use immediately.

(Continued on page 174)

Fig. 7—Exploded view of the spark-plug assembly. From right to left are the shielded spark plug, ceramic sleeve, washer, cap and shielded cable.



80 Through 6 with the BC-454

Extending the Frequency Range of a Popular Receiver

BY LEWIS G. McCOY,* W1ICP



This view shows the layout of the converter parts on top the chassis. To the right of the aluminum shield are the 6AU6 and the L_1L_2 coil assembly. The 6U8, L_3L_4 coil assembly and the crystal are on the other side of the shield, with the oscillator coil to the rear. The RG-58/U coax lead from the antenna terminal of the BC-454 is plugged into J_3 .

The two knobs at the right front of the chassis are for C_1 and C_2 . The hole at the center and the knob at its left are used in another modification to be described in a coming issue. The knob at the far left is the audio control described in January QST.

IN a recent article describing the conversion of a BC-454 surplus receiver,¹ which tunes from 3 to 6 Mc., it was pointed out that the BC-454 would make an excellent tunable i.f. for use with a crystal-controlled converter. This article describes such a converter, extending the frequency range of the setup so that all amateur bands from 3.5 through 50 Mc. can be covered.

The addition of the converter does not affect the 3.5-4-Mc. coverage, which is still the same, using the BC-454 by itself. When the converter is used, the BC-454 becomes a 3-to-6-Mc. tunable i.f. There is a decided advantage to using the BC-454 this way because its stability and tuning rate are maintained for the entire receiver when using a crystal-controlled converter for the higher-frequency bands.

The converter uses two tubes, one for an r.f. amplifier stage and the other for a combination mixer-oscillator. The r.f. and mixer stages are individually tuned, which eliminates tracking problems usually associated with building a gang-

tuned converter. This in turn simplifies construction and design. Also, by being able to tune the two stages separately you can always be sure your receiver front end is lined up. The output circuit of the converter is untuned, so no adjustment of this circuit is necessary.

Circuit Details

As shown in Fig. 1, the converter circuit uses a 6AU6 r.f. amplifier and a 6U8 mixer-oscillator. In order to simplify the design and get away from the complexities of band switching, plug-in coils are used. As you will find when checking the coil information, the design is such that each r.f. coil, L_1L_2 , and mixer coil, L_3L_4 , will cover two bands. This means, of course, that only two sets of these coils are required to cover 7 through 28 Mc., a separate set being needed for 50 Mc.

The triode portion of the 6U8 operates as a crystal-controlled oscillator whose output is coupled to the mixer via the capacitance existing between the pentode and triode elements within the tube. It was found on testing the converter that no additional mixer injection was required.

A short length of RG-58/U is used to couple

* Technical Assistant, QST.

¹ McCoy, "Getting Started with the BC-454," QST, January, 1959.

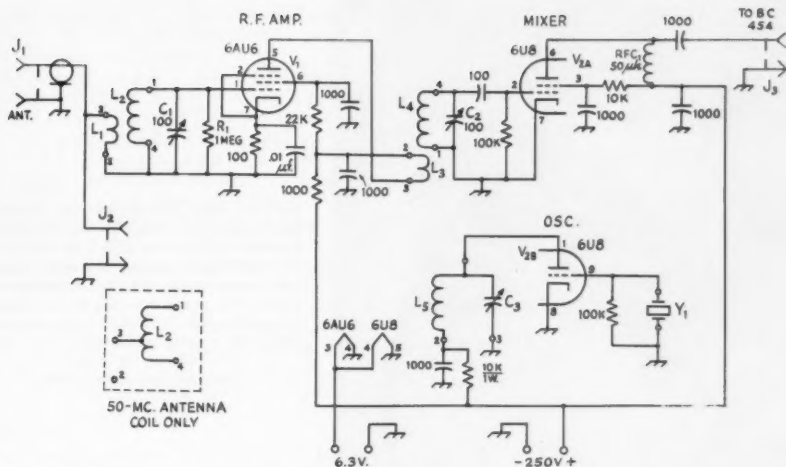


Fig. 1—Circuit diagram of the crystal-controlled converter. Unless otherwise indicated, capacitances are in $\mu\text{mf.}$, resistances are in ohms, resistors are $\frac{1}{2}$ watt.

C_1, C_2 —100- $\mu\text{mf.}$ variable capacitor (Hammarlund MAPC-100-B, Hammarlund MC-100-M, or E. F. Johnson 149-5).

C_3 —Trimmer capacitor, one needed for each oscillator coil; 30 $\mu\text{mf.}$ (Centralab type 827C, El Menco type 461, Allied 60 H 335) for all bands except 7-Mc. circuit for 3400-kc. crystal. C_3 for this 7-Mc. coil is a 100- $\mu\text{mf.}$ mica fixed capacitor.

J_1 —Coax chassis receptacle (Amphenol 83-1R).

J_2, J_3 —Phono jack.

RFC1—50- $\mu\text{h.}$ r.f. choke (National R-33, Miller 34300-50).

Y_1 —7 Mc.—3400 kc.

14 Mc.—10,500 kc.

*21 Mc.—17,500 kc.

28 Mc.—24,500 kc.

50 Mc.—46,500 kc. (International Crystal Co. type FA-9).

Coil Data

7 & 14 Mc.— L_1, L_3 —4 turns No. 20, 1-inch diam., 16 t.p.i. (B & W 3015).

L_2, L_4 —15 turns No. 20, 1-inch diam., 16 t.p.i. (B & W 3015).

* $L_5, 7$ Mc.—32 turns No. 24, 1-inch diam., 32 t.p.i. (B & W 3016).

$L_5, 14$ Mc.—16 turns No. 24, 1-inch diam., 32 t.p.i. (B & W 3016).

21 & 28 Mc.— L_1, L_3 —3 turns No. 20, 1-inch diam., 16 t.p.i. (B & W 3015).

L_2, L_4 —7 turns No. 20, $\frac{3}{4}$ -inch diam., 16 t.p.i. (B & W 3011).

* $L_5, 21$ Mc.—10 turns No. 20, 1-inch diam., 16 t.p.i. (B & W 3015).

$L_5, 28$ Mc.—9 turns No. 20, $\frac{3}{4}$ -inch diam., 16 t.p.i. (B & W 3011).

L_1 and L_2 are made from a single length of B & W coil stock. The coils are separated by one turn, the 5th, which is cut and unwound from the support bars. L_3L_4 is exactly the same as L_1L_2 .

L_1 fits over L_2 and is positioned near the bottom of L_2 . L_3L_4 is the same as L_1L_2 .

50 Mc.— L_2 —5 turns No. 20, $\frac{3}{4}$ -inch diam., 16 t.p.i., tapped 2 turns from ground end (B & W 3007).

L_3 —5 turns No. 20, $\frac{1}{2}$ -inch diam., 16 t.p.i. (B & W 3003).

L_4 —5 turns No. 18, $\frac{3}{4}$ -inch diam., 8 t.p.i. (B & W 3010).

L_3 is inserted inside L_4 .

L_5 —4 turns No. 20, $\frac{1}{2}$ -inch diam., 16 t.p.i. (B & W 3003).

* Not actually required; see text.

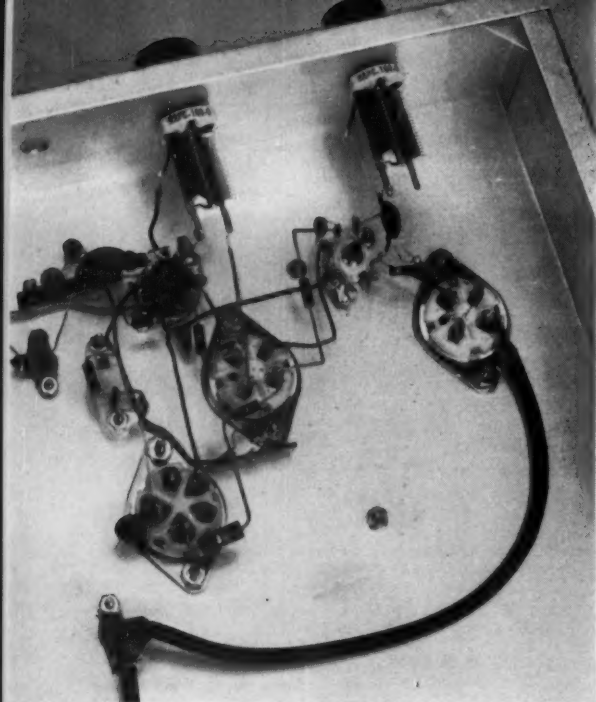
the output of the converter to the BC-454. For 7 Mc. and higher bands one end of the coax is connected to the antenna terminal of the BC-454 and the other end is plugged into J_3 . When 3.5-Mc. coverage is desired (the BC-454 by itself) the converter end of the coax should be connected to J_2 and the r.f. coil L_1L_2 should be removed from its socket. The purpose of R_1 is to provide a d.c. return for the grid of the 6AU6 when the coil is removed.

Construction

The original article included a description of a power supply which, along with the BC-454, was mounted on a chassis large enough to provide space for future additions, such as this converter.

If you compare the photographs in January *QST* with those in this article you will see how the space was used for the converter. However, the converter can be built on a separate chassis if you wish, but in that event you should follow the layout shown in this article. The chassis size is unimportant so long as it is large enough to accommodate the components. One as small as $2 \times 5 \times 7$ inches would provide more than enough room for the parts. Also, if you build a separate power supply for the converter alone, it should furnish approximately 250 volts d.c. at 40 ma. and 6.3 volts a.c. at 1 amp.

Before starting construction study the top and bottom views to see how the tube and coil sockets are arranged. Note that a metal shield is used on



The input, mixer, and oscillator coil sockets run from right to left in this view. The 6AU6 socket is at the right and the 6U8 is at the left. The two variables, C_1 and C_2 , are mounted on the front panel in line with the associated coil sockets. The crystal mounting is near the oscillator coil socket. J_3 is beside it and J_2 is at the lower left. A piece of RG-58/U runs from J_2 to the antenna connector, J_1 , on the rear wall of the chassis.

top of the chassis to separate the r.f. and mixer circuits. The shield is made from a piece of aluminum measuring 3×5 inches.

Four-prong forms and sockets are used for the r.f. and mixer coils. These coils are identical on each band, except 50 Mc., so there is no danger of plugging a coil into the wrong socket. A five-prong coil form and socket are used for the oscillator; this helps avoid confusion when changing bands, although only three terminals actually are needed.

When installing the 6AU6 socket mount it so that Pin 1, the grid terminal, faces the L_1L_2 socket. The metal pillar (called the "shield") in the center of the socket should be grounded to a grounding lug mounted under one of the socket screws. When wiring, keep all lead lengths as short as possible.

The antenna terminal, J_1 , is mounted on the rear chassis wall and connected to J_2 by a short length of RG-58/U coaxial cable. Another short length of RG-58/U is used to connect from J_2 to the socket terminal of L_1 .

The Coils

Making the coils is a very simple process as there is no winding of wire involved. Amphenol type 24-4P and 24-5P transparent polystyrene coil forms are used to hold the coils, which are made from various sizes of B & W Miniductor stock. The coils are mounted inside the polystyrene forms and held in place by their own leads, the ends of which are soldered to the coil-form prongs.

The oscillator coils must be tuned to the crystal

frequency. This is done by mounting a small capacitor along with the coil inside the form. With the exception of the one used in the 3.4-Mc. circuit all the capacitors are variable. The method of mounting the coil and capacitor is shown in the photograph of an assembly with a portion of the polystyrene form cut away to give a better view.

Before soldering the coil leads file off the nickel plating on the ends of the prongs. This makes the soldering job easier, because solder doesn't take too well on nickel. Also, hold the prong being soldered with a pair of pliers to conduct the heat away from the polystyrene coil base. Too much heat will loosen the pin. *Important:* after soldering the leads, clean off all traces of rosin that may have accumulated on the prongs.

Getting It To Work

After you make your first set of coils you are ready to test the unit. Connect an antenna to J_1 , connect the coax lead from the BC-454 to J_3 , turn on the power supply, and let the unit warm up. If you have a voltmeter you can check the voltages on the tubes to make sure they are approximately correct. The voltages measured from chassis, using a 20,000-ohms-per-volt meter, were as follows: plate of the 6AU6, 200 volts; screen, 125; 6U8 pentode plate, 200, screen, 150; 6U8 triode plate, 125. These voltages are approximate so don't be too concerned if your setup is different. A variation of as much as 20 per cent either way should be O.K., but voltages measured through a high resistance, as at a screen grid,

may be somewhat lower than given above if a voltmeter of lower internal resistance, such as 1000 ohms per volt, is used.

Next, check to see if the crystal-controlled oscillator is working. There are a couple of methods that can be used to do this. The positive lead from your voltmeter can be connected to the chassis and the negative lead to the grid of the 6U8 triode. Use an r.f. choke (2.5 or 1 mh.) in series with the lead from the voltmeter to the grid. If the oscillator is working the meter will show a reading of a few volts. If there is no reading, adjust C_3 so that the oscillator starts. The best adjustment of C_3 is the one that gives the maximum voltage.

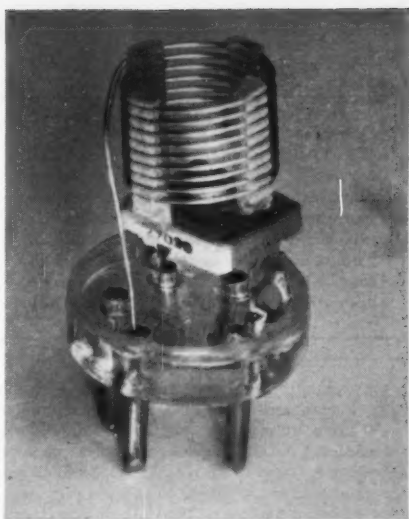
Another way to check is to measure the positive voltage at the junction of the 10,000-ohm, 1-watt resistor and C_3 . When C_3 is tuned through its range the voltage will go through a maximum value. The oscillator is working when the voltage is maximum.

Still another method of checking is with an absorption-type wavemeter, not the light-bulb type but one that uses a milliammeter as an indicator.² To check the oscillator, couple the wavemeter to the oscillator coil and tune the wavemeter to the crystal frequency. If the oscillator is working you will get an indication on the wavemeter. If not, try another setting of C_3 and recheck with the wavemeter. The setting of C_3 that produces oscillation is quite broad so you shouldn't have too much trouble getting the circuit to work.

With the crystal oscillator frequencies specified in Fig. 1, the low-frequency edge of each amateur band will be at 3.5 Mc. on the BC-454, with one exception. The exception is the 7-Mc. band, the low-frequency edge of which starts at 3.6 Mc. on the dial. To make the band start at 3.5 Mc. the oscillator frequency also would have to be at 3.5 Mc., and all you would hear at the low end of the 7-Mc. band would be the crystal oscillator.

If you don't mind tuning the BC-454 "backwards," two crystals and two of the oscillator coils can be eliminated. The oscillator coil information for the 3400- and 17,500-ke. crystals is given for those who prefer to have their receivers tune in the same direction on all bands. If you choose to use the 10,500-ke. crystal and oscillator coil to cover both 7 and 14 Mc., both bands will start at 3.5 Mc. on the BC-454 dial but you'll tune toward 3.2 Mc. for the 7-Mc. band and toward 3.85 Mc. for 14 Mc. A similar method of tuning is required for 21 and 28 Mc. when using the 24,500-ke. crystal and oscillator coil. If you are interested in learning more about the "how" of converters the subject is covered in an article in October 1958 QST.³

When you have the oscillator working, tune the BC-454 to 3.5 Mc. and adjust C_1 and C_2 for maximum background noise. Also, you'll have to peak the antenna trimmer on the BC-454. Now tune around and find an amateur signal. You will



An oscillator tuned-circuit assembly with part of the polystyrene coil form removed to give a better view of the coil and capacitor mounting.

probably find that you can peak the signal by readjusting C_1 , C_2 , and the antenna trimmer on the BC-454. We found with the unit described here that a single setting of the controls would cover the c.w. portion of any band up to 28 Mc. and no readjusting within a band was needed. On 28 and 50 Mc. you'll find that the controls will have to be readjusted if more than 200 kc. is to be covered. You may also find that adjusting the oscillator trimmer, C_3 , will peak up the performance a bit, but this need only be done once for each band.

A comparison between the BC-454-converter combination and a high-quality communications receiver showed that stability and sensitivity were all that one could ask for—any signal heard on the regular receiver came in just as well on the BC-454. Selectivity leaves something to be desired, but we are working on an addition to improve that part of the receiving setup and hope to have some information available soon. Aside from selectivity, it would take a lot of dollars to buy a receiver comparable with the BC-454-plus-converter.

QST

Strays

K6ODY was testing out a 100-watt transmitter using a 100-watt light bulb as a dummy load, and was heard and called by K6USL. K6USL was feeding a lower-powered antenna—he only had a 25-watt bulb tied to his rig!

K4RJM put a spinner knob on his v.f.o. and now covers the band in 3.5 seconds instead of 10.

² McCoy, "A Novice Band Checker," QST, July, 1958.

³ McCoy, "The 'Bonus' 21-Mc. Converter," QST, October, 1958.

Transistorized Electronic Key and Monitor

The electronic key circuit devised by W9TO has earned a high reputation for itself among the connoisseurs of electronic keying. In WSLAN's version transistors are substituted for the vacuum tubes used in the original circuit. The result is a unit that, except for the battery, takes less space on the operating table than an ordinary key.

A Semiconductor Version

of a Multivibrator

Character-Forming System

BY MARLAND M. OLD,* WSLAN

AFTER building and operating several electronic keys described in *QST* and other publications during the past few years I was fortunate to obtain the schematic of a vacuum-tube keyer, originated by W9TO,¹ which had the good features of all the keys tried previously plus some of its own. The key featured self-completing dots and dashes, all-electronic timing, a single inexpensive keying relay, and an exact two-to-one dash-dot ratio² at all speeds. The keyer described in this article is a transistorized version of that design, complete with monitor and key lever, all enclosed in a box chassis 4 by 2½ by 1½ inches and operating from a single 22½-volt battery.

Circuit Operation

Those not familiar with transistor operation might find it helpful to consider the transistor to be crudely analogous to the triode vacuum tube with the base corresponding to the grid, the collector to the plate, and the emitter to the cathode. Note, however, that the p-n-p type CK722 transistor used in the keyer requires voltages opposite in polarity to those on the corresponding elements of a tube.

In the block diagram of Fig. 1, all transistors will be considered as switches, either open from collector to emitter ("off"), or closed ("on"), according to the currents being fed to the bases. If the base is at emitter potential (no base current flowing) the collector-to-emitter resistance will be high and only a small leakage current will flow. A transistor in this condition will be considered to be open or "off." If the base is fed a current from a voltage of the same polarity as the collector, the collector-to-emitter resistance becomes very low and the circuit can be considered to be closed or "on."

Transistors Q_1 and Q_2 are connected in a free-running multivibrator circuit that generates the basic pulses for producing dots and dashes. This stage will be referred to as the pulse generator.



This electronic keyer—including a monitor with loudspeaker—takes up less space than the average bug. The only component not contained in the 4 × 2½ × 1½-inch box is the 22½-volt battery that runs the transistors. The screw-driver-adjusted control is for the mark-space ratio; the one with the knob is the speed control.

Transistors Q_5 and Q_6 are connected in a pulse-counting bistable multivibrator circuit which when driven by the pulse generator will produce pulses at exactly one-half the rate of the basic pulse frequency. This stage will be referred to as the pulse counter.

Transistors Q_3 , Q_4 , and Q_7 operate as switches to control the operation of the pulse generator, the pulse counter, and the keying relay.

With the keyer at rest, Q_3 and Q_4 are "off," keeping Q_2 and Q_5 "off." Since Q_2 and Q_5 are "off," Q_1 and Q_6 are "on," with their collectors at or near emitter potential. (In a multivibrator circuit when one transistor is "off" the other must be "on" and vice versa.)

To produce a single dot the key lever may be tapped to the dot side and released, thus momentarily placing negative battery on the base of Q_3 and forcing it to the "on" condition. This negative voltage is prevented from reaching the base of Q_4 by diode CR_1 . With Q_3 "on," the pulse generator starts to oscillate, with Q_2 switching to the "on" condition while Q_1 goes to the "off" condition. As Q_1 goes to the "off" condition its collector rises almost to the negative battery potential since there is little voltage drop across the collector load resistance with little current flowing through it. Current from this negative potential is fed to the base of Q_5 , keeping it in the "on" condition even with the key released.

* 4739 Sandra Lynn, Mesquite, Texas.

¹ To the best of our knowledge this circuit has not been described in any periodical, but has been furnished privately by W9TO to a number of amateurs. — Editor.

² That is, ratio of the time occupied by a dash-plus-space to the time occupied by a dot-plus-space. — Editor.

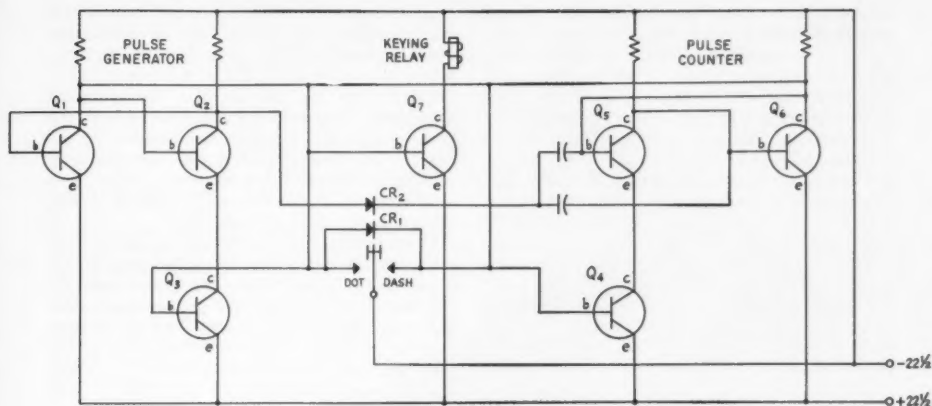


Fig. 1—Block diagram of transistorized keyer.

It is also fed to the base of Q_7 , turning it "on" and thus operating the keying relay. As the half-cycle point is reached Q_2 cuts off and Q_1 returns to the "on" condition, returning Q_3 and Q_7 to the "off" condition and releasing the keying relay. The circuit is then returned to the resting condition.

Forming a Dash

To send a single dash, the key lever may be tapped to the dash side, momentarily placing negative battery on the base of Q_4 , and on the base of Q_3 through CR_1 . Q_1 turns "on," readying the pulse-counting circuit for operation once a positive-going pulse is received from the pulse generator. (The pulse-counter transistors Q_5 and Q_6 will reverse their "on" and "off" conditions only upon reception of a positive-going cut-off pulse impressed upon the bases.) Since negative battery was also placed on Q_3 through CR_1 , the pulse-generating circuit starts a dot cycle as described in the preceding paragraph. As Q_2 turns "on" the collector drops almost to the positive emitter potential. Diode CR_2 carries this positive-going pulse to the bases of Q_5 and Q_6 , causing Q_6 to turn "off" and Q_5 to go to the "on" condition. With Q_6 "off," the collector is at a high negative potential and currents from this potential are fed to the bases of Q_3 and Q_4 , holding the two control transistors "on." Current is also fed to the base of Q_7 which, along with the current from the collector of Q_1 , causes Q_7 to conduct and operate the keying relay.

The pulse generator completes one cycle and starts another, since Q_3 is held "on" by current from the collector of Q_6 . At the instant the second cycle starts, another positive-going pulse is emitted from the collector of Q_2 and the condition of the pulse-counting circuit again reverses, with Q_5 going to "off" and Q_6 going to "on." With the collector of Q_6 again near emitter potential no currents flow from it to the bases of Q_3 , Q_4 , or Q_7 . With no current to the base of Q_4 the pulse-counting circuit is disabled. Q_3 and Q_7

are kept "on," however, by currents from the collector of Q_1 , until the end of the first half of the second cycle. At that time Q_1 returns to the "on" condition and releases Q_3 and Q_7 for the last half of the second cycle. The circuit again returns to the resting condition unless the key lever has been kept in the dash position or has been operated to the dot side. Fig. 2 illustrates the generation of a dash.

Note that the positive-going pulses from the collector of Q_2 are carried to the bases of Q_5 and Q_6 through CR_2 , a 1N34. CR_2 is used to prevent the possible operation of the pulse-counting circuit by negative-going pulses. Its use is not always necessary since the circuit is relatively insensitive to negative-going pulses.

Components

It is suggested that the base-emitter junction of a transistor be used for CR_1 , since the diode must have high back resistance to prevent the operation of the pulse-counting circuit with the key held to the dot side. The base-emitter junctions of common transistors generally have a back resistance of one to ten megohms, which is far superior to the back resistance of a 1N34. A 1N34 selected for a high back resistance may

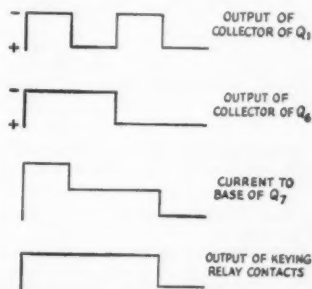


Fig. 2—Time sequence in forming a dash and following space.

be used, but unless the builder has several already on hand to select from it would probably be better to purchase a CK722 or similar transistor for use as a diode. If an p-n-p type of transistor is used the emitter will be connected to the dot contact of the key and the base to the dash contact. (The collector is left open and the lead may be snipped off.) If an n-p-n type is used the opposite connections should be used. The transistor used for CR₁ in the key described is a Philco p-n-p type T0037, although a CK722 would have worked as well.

The keying relay is an inexpensive miniature type originally designed for model control work. No contact ratings are given for this relay but because of its small size it is assumed that the builder will be cautious in attempting to key high voltages or currents with it. The keyer shown has been used to key the cathode of an 807 with a plate current of 100 ma. and a plate voltage of 500.

Keying Monitor

The monitor section of the keyer utilizes a CK722 transistor connected as a blocking oscillator with a subminiature push-pull output trans-

former, as shown in Fig 3. An oscillator of this type produces an output rich in harmonics, which is pleasing to the ear and much less tiring than a sine-wave tone. The monitor is keyed as follows: With the key at rest the grounded armature of the keying relay rests against the back contact of K₁, which is connected to the base of Q₈, thus grounding the base and preventing oscillation. When the keying relay operates, ground is removed from the base of Q₈ and the monitoring tone is produced.

In an earlier model of the keyer, satisfactory keying was accomplished using the back contact of the relay to short the voice-coil winding of the transformer to ground. (The transformer used was a husky one salvaged from an old auto radio.) Attempting to use this method of keying with the model described resulted in chirpy keying caused, no doubt, by the characteristics of the extremely small transformer.

If a transformer is used that will allow satisfactory voice-coil keying, the negative rather than the positive battery terminal can be grounded, thus placing the key lever at chassis potential. Should a bug or other keying mechanism separate from the keyer be used, it would

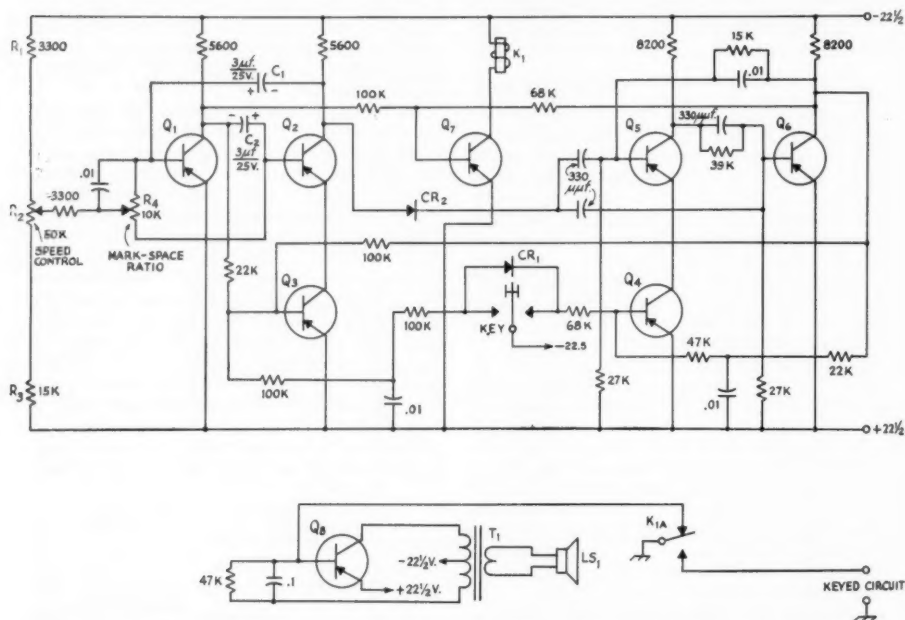
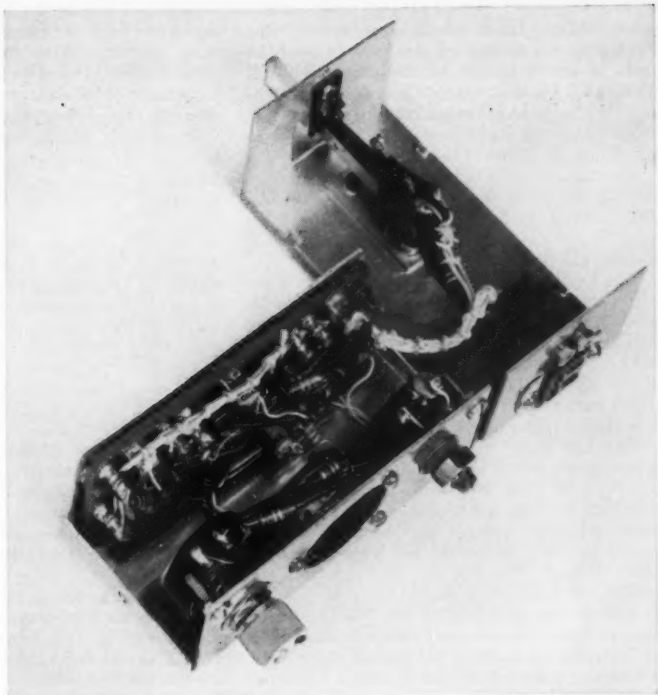


Fig. 3—Circuit diagram of the keyer. Unless otherwise indicated, capacitances are in $\mu\text{f.}$, resistances are in ohms, resistors are $\frac{1}{2}$ watt. Capacitors with polarity indicated are electrolytic; others are ceramic tubular or disk, 50-volt rating. See text for discussion of grounding to chassis.

C₁, C₂—3- $\mu\text{f.}$ miniature electrolytic, 25 volts (Calrad TC-325).
CR₁—CK722, collector connection not used (see text).
CR₂—1N34A.
K₁—Sp.d.t. relay, 5000-ohm coil (Lafayette F260).
LS₁—P.m. speaker, $1\frac{1}{4}$ inch (Lafayette SK96).
Q₁—Q₇, inc.—CK722.

Q₈—CK722 (see text).
R₁, R₂—See text.
R₃—50,000-ohm control (Ohmite CU).
R₄—10,000-ohm control (Ohmite CLU).
T₁—Output transformer, 500 ohms to 3.2 ohms (Lafayette TR99).

Most of the parts are on phenolic terminal boards mounted on the sides of the box. The key mechanism mounted on the bottom (at top in this photograph) is made from relay parts. Layout of components is not critical, and any convenient type of construction may be used.



be advantageous to have the base of the key at chassis potential to prevent shorting the battery if the key should happen to touch the keyer or the transmitter. If satisfactory voice-coil keying is not obtained and a grounded key lever is still desired, an n-p-n type transistor may be used in the monitor by reversing the polarity of the voltage supplied to the oscillator. The negative battery terminal may then be grounded, since that polarity is required on the base of an n-p-n transistor to prevent oscillation.

The resistor and capacitor values shown in the monitor oscillator schematic result in an output frequency of about 500 cycles, which is near the resonant frequency of the speaker. The resistance may be decreased to increase the oscillation frequency, or vice versa, to suit the individual tastes of the builder. It is suggested that the monitor be completed and tested before attempting to test the keyer, since proper operation of the keyer can most easily be detected with the ear.

Transistor Characteristics

If a transistor tester is available when purchasing the CK722s it would be well to ask your distributor to allow you to select a group of transistors from his stock to avoid getting any exceptionally low-gain units. CK722s usually have current gains ranging from about 10 to 60, with most falling in a range of 20 to 40. Out of about forty or fifty CK722s tested in selecting

transistors for several models of this keyer only three or four have had to be rejected because of gains as low as 8 to 12. If a tester is not available it would be wise to use transistor sockets to allow easy substitution should trouble be experienced in getting the keyer to work properly. In the model shown CK722s with gains from 24 to 54 were used. Transistors with exceptionally high current gains (100 or more) should not be used except possibly in the pulse generator. Higher-gain transistors generally have higher leakage currents and are especially undesirable in the control transistor stages, Q_3 , Q_4 , and Q_7 , since their leakage currents are often high enough to allow operation of the pulse generator, pulse counter, and the keying relay while they are supposedly in the "off" condition.

Constructional Details

The keyer shown in the photographs was constructed in an LMB box chassis No. 00. A piece of $\frac{1}{2}$ -inch phenolic board obtained from the surplus section of a local wholesale house was trimmed to a size that could be fastened to the $1\frac{1}{2}$ x 4-inch side of the box by two $\frac{1}{2}$ -inch 6-32 screws. A piece of flexible $\frac{1}{16}$ -inch plastic was cut to size and sandwiched between the phenolic board and the side of the chassis to prevent the bradded ends of the terminals from touching the chassis. The terminals were also obtained from the surplus section of the local distributor and appear to be similar to USECO

1330D terminals. Since a swaging tool was not available the rivet braddding tool from the XYL's leather tooling set was used to brad the ends of the terminals to the phenolic board. Perforated $\frac{1}{16}$ -inch bakelite boards with matching "flea" clips to fit the perforations are available from Lafayette Radio and have been used to construct one model of the keyer.

The transistors in this keyer were mounted by drilling the phenolic board with a $\frac{1}{8}$ -inch drill and reaming the holes to a size that provided a snug fit for the transistors. Ordinary household cement was used to secure them.

The keying relay and speaker transformer are also mounted on the phenolic board, along with most of the resistors and capacitors. The speaker and the controls were mounted on the opposite side of the chassis, leaving a corridor through the middle of the box for the key lever and a Jones socket, type S304AB, to fit into when the box chassis is put together.

The key lever was constructed from some relay contact assemblies that are similar to those available in the Guardian universal "200" series of contact assemblies. An extra switch blade with the contact end snipped off was placed on either side of the key lever to provide extra stiffness. The dot and dash contacts are backed by a horseshoe-shaped piece of bakelite to give the key a more solid feel. The paddle for the key lever was fashioned from a $\frac{1}{8}$ -inch piece of Plexiglas by marking the desired shape with a scribe and sawing around it with a hacksaw, being careful not to saw into the scribe marks. A sheet of fine sandpaper was placed on the flat surface of a table and the edges of the paddle were sanded down to the scribe marks by a series of circular motions with the paddle. The key lever end of the paddle was drilled, tapped, and fastened to the end of the key lever with a 4-36 screw.

Four holes were drilled in the bottom of the chassis and tapped for 4-36 screws for fastening rubber feet to the keyer.

Extreme care must be used when soldering the transistors and the diodes into the circuit to avoid damaging them with the soldering heat. The transistor and diode leads should be the last leads soldered to their respective terminals. They should be tinned and quickly spot soldered to the terminals while holding the leads with a pair of long-nose pliers between the transistors and the terminals. The leads should be held until all soldering heat has been dissipated from the terminals. If transistor sockets are used all connections to the socket terminals should be made with the transistors removed.

Operation

After the keyer is completed and the wiring thoroughly checked for errors the speed and mark-to-space ratio controls should be set in the middle of their ranges and the battery connected. A string of dots or dashes should result when the key lever is held to one side or the other. The mark-to-space ratio control should

be adjusted to give 50 per cent of full-scale reading on an ohmmeter connected across the keying-relay contacts. With the mark-to-space ratio control adjusted on dots the ohmmeter will read 75 per cent of full scale on dashes, indicating that correctly proportioned dashes are being produced.

Successively smaller values of R_1 and R_3 may be tried until points are reached where the keyer fails to function properly at the extreme ends of the speed-control range. R_1 and R_3 can then be increased slightly so that proper operation can be obtained over the entire range of the speed control. A range of at least 10 to 45 w.p.m. should be attained, using coupling capacitances of 3 μ f. each as specified in the diagram. Increasing these capacitances will move the range toward lower speeds, and vice versa. For example, in two models of this keyer it was found that the speed range was 7 to 33 w.p.m. if the capacitors were 5 μ f. each, and 25 to 100 w.p.m. if both capacitors were 2 μ f.

Although most 22 $\frac{1}{2}$ -volt batteries available will supply the average current of about 12 ma., some of the smaller batteries will not supply the peak currents demanded by the keyer for proper operation. It is recommended, therefore, that batteries larger than the smallest available be used.

When using the keyer keep in mind that transistors are temperature-sensitive devices and should not be subjected to extremely wide variations of temperature. Therefore do not operate the keyer close to heat-producing gear — for instance, on top of the receiver or transmitter. No difficulty from internally produced heat will be experienced, naturally, since only 0.3 watt is required to power the keyer. (Over six times that amount is required for the filament of a 6J5.)

Those who are trying an electronic key for the first time will find that considerable practice is required to master one. Old sending habits that resulted in incorrectly timed dots or dashes must be broken before the keyer can be used successfully. The effortless keying and the perfectly-timed characters attainable with this keyer make it a worthwhile project for any radio amateur.

QST

Stays

Operation World-Wide gets underway on April 20 when a MATS Globemaster takes off from New Jersey bound on a round-the-world flight. The prime mission of the plane will be to make a documentary film on MATS, but on board will be WSOLJ, operating aeronautical mobile, along with W2SKE and W2BAK. Look for them on sideband.

Ham employees of the Santa Fe Railroad are forming a ham club, with membership dues of \$1.00 per year. Any interested Santa Fe employees should contact W. E. Courtney, WA6BGI, 1169 Crestview Ave., San Bernadino, Calif.

Correction! That EICO wall chart mentioned on page 15 of April is free only to teachers.

Simplified Product Detector Design

BY JOEL L. EKSTROM,* W1UGX/3

THE present-day popularity of single-sideband techniques has been responsible for the development of a number of product detector circuits, most of which, when adjusted properly, perform more or less as intended. A survey of the literature seems to indicate that the Crosby product detector and the pentagrid converter are the circuits most commonly used. It is possible to adjust the Crosby detector so as to minimize intermodulation distortion, but it uses at least two triodes (preferably three) and does not have a large signal-handling capability. The pentagrid converter, on the other hand, does not have these disadvantages, but does not usually have an intermodulation balance control.

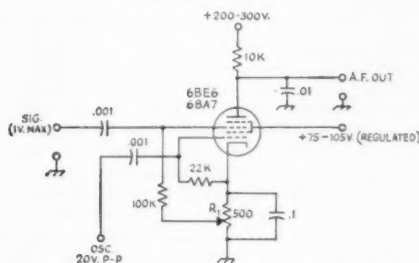


Fig. 1—Pentagrid converter in product detector with control for minimizing intermodulation. Capacitances are in $\mu\text{f.}$; resistors are $\frac{1}{2}$ -watt composition with the exception of R_1 , which is a carbon potentiometer. This circuit is for use with a separate beat-frequency oscillator. A.f. output should be fed to the following audio amplifier grid through the usual blocking capacitor.

It is the purpose of this note to describe a simple pentagrid converter which may be either self- or separately-excited, and which has an intermodulation balance adjustment to reduce rectification effects. While no exact quantitative measurements are available to compare it with the Crosby circuit, an oscilloscope examination of the output shows the performance to be quite

* 2006 Swansea Road, Baltimore 14, Md.

satisfactory when the circuit is properly adjusted.

Fig. 1 shows the separately-excited detector, and Fig. 2 is its self-excited brother. Both work well at the common i.f. frequencies of 50 to 500 kc., although more plate circuit filtering would probably be advisable at the lower intermediate frequencies, to prevent local-oscillator saturation of the audio circuits following the detector.

Adjustment of these circuits is not difficult, but is best done with the aid of an oscilloscope. With the oscillator circuit working correctly at the proper frequency, two half-volt low-frequency (approximately 5 kc.) audio signals separated in frequency by about 500 c.p.s. should be applied to the signal input, and R_1 adjusted to minimize the difference-frequency component in the output. The null should be fairly sharp.

A half-volt signal is about the maximum signal that should be used for testing. If the intermodulation adjustment is made for a half-volt signal it should hold for signals smaller than that quite well. If the balance is made with a larger test signal, the balance will not be correct for signals larger or smaller than that level.

QST

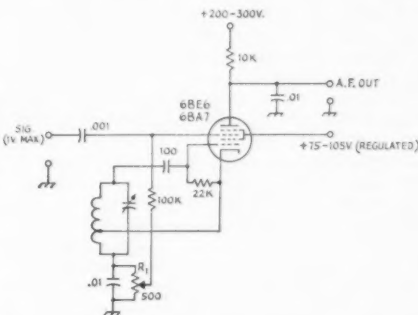


Fig. 2—Product detector circuit with self-excitation. Values are similar to those in Fig. 1. The b.f.o. tuned circuit can use any b.f.o. transformer designed for the particular intermediate frequency used.

Strays

W8RNB called CQ Albuquerque with traffic and raised K5IFB. Both are named Raymond Oliver.

— — — —

W0JBT, a golf course superintendent, would like to QSO other hams in the same business. (He doesn't say what bands he works, so if you run across him it'll be like making a hole-in-one.)

— — — —

K2IOW has cleaned up most of his TVI and

BCI, but one case continues to baffle him. A neighbor reports that late at night he hears K2IOW coming up out of the bathtub drain. When the drain plug is put in, K2IOW is cut off. Obviously, this tub does not have the customary trap.

— — — —

Young Andy Marx, after listening to some of the signals on sideband, asked his mother (WA6DFJ) if those people were born that way.

• Recent Equipment—

The RME VHF-126 Converter



The RME VHF-126 Converter for 50, 144 and 220 Mc. is similar in size and appearance to the 4350-series receivers of the same make.

ONE of the first pieces of commercial gear ever to be made available to the v.h.f. fraternity was the RME DM-36 "Expander." This two-band converter, produced more than 20 years ago, gave many a 10-meter man his first look at the world above 50 Mc., with its bandswitching coverage of 56 and 28 Mc. You can still find a DM-36 here and there, converted to the 50-Mc. band, and still doing quite well. Its postwar successor, the VHF-152, brought hundreds of recruits to the 6- and 2-meter bands. Hams who bought it for use on 10 took a look at the higher bands now and then, and a look was often enough to start the v.h.f. bug biting. If the subject of this discussion, RME's new VHF-126,* does as much for the 220-Mc. band, it will be a boon, indeed.

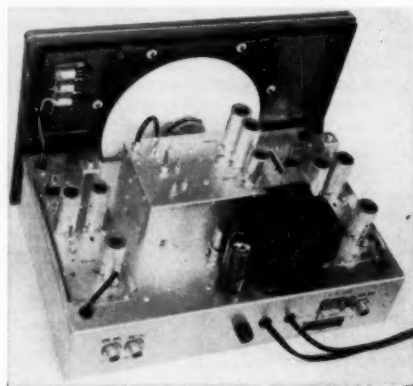
The DM-36 and the VHF-152 were simple tunable converters, with oscillator, mixer and r.f. amplifier circuits switched in changing bands. This meant that circuit design could not be completely optimized for all the bands covered, and it entailed other compromises with the ideal. Oscillator circuit switching added mechanical instability to the already considerable problem of designing a tunable oscillator that would be useably stable at 144 Mc. from a drift point of view. These limitations are bypassed in the latest product.

In the VHF-126 we have a new approach to three-band converter design, providing coverage of all three amateur v.h.f. bands with optimum performance on each. The converter approaches a communications receiver in size and cost, but it does the job on 50, 144 and 220 Mc. in a way that would be impossible with simple bandswitch-

ing. The basic tuning unit is a 50-Mc. converter of conventional design, having a tunable oscillator designed for high stability and accurate dial calibration. The oscillator tunes down to about 41.5 Mc., so that coverage of the converter extends to about 48.5 Mc., a handy feature in checking the possibility of 50-Mc. DX openings by examination of the commercial and experimental frequencies below the band edge. It also gives a tunable i.f. range of slightly more than 5 Mc., so that the complete 220-Mc. band and the 144-Mc. band can be covered, with some leeway on each end, with the built-in crystal-controlled converters for these bands.

The 126 is shown in block diagram form in Fig. 1. The converters for 220 and 144 Mc. are of similar design, using a 6AM4 grounded-grid r.f. amplifier ahead of a 6BQ7A mixer and cathode follower. Crystal-controlled injection is supplied by a 6BQ7A oscillator-doubler. The 50-Mc. converter has a 6BQ7A cascode, a 6U8 mixer and cathode follower, and a 6AF4A tunable oscillator. Separate coaxial antenna inputs are provided for the three v.h.f. bands. A two-terminal strip allows an antenna for lower bands to be connected through the converter, so that no making and breaking of connections to the communications receiver need be done when the receiver is operated on frequencies below 50 Mc.

The size, finish and dial design of the VHF-126 are similar to the RME 4350 and 4350A receivers. The two-speed friction drive dial is very handy in v.h.f. work, providing a quick way to run up to the opposite end of the long tuning range when



Interior view of the VHF-126, showing the converters for 220 and 144 Mc. at either side, and the tunable 50-Mc. converter at the center. Dial is large friction-drive illuminated type with two-speed tuning. Power supply and voltage regulator for the oscillator are included.

* RME Division, Electro-Voice, Inc., Buchanan, Mich.

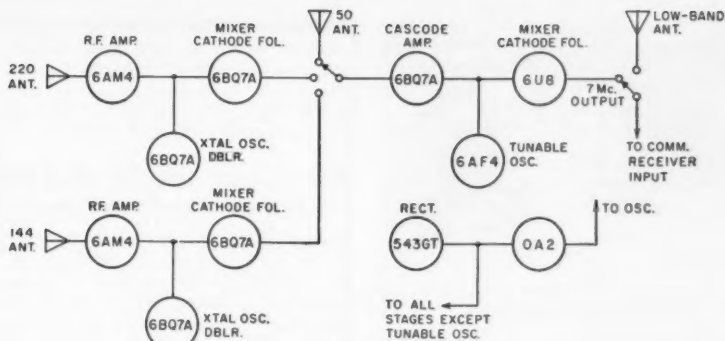


Fig. 1—Block diagram of the RME VHF-126 Converter. Crystal-controlled converters for 220 and 144 Mc. work into a tunable 50-Mc. converter having 7-Mc. output.

it is needed, but at the same time giving a smooth "feel" on the slow-tuning knob. The band in use is indicated by panel jewels in three colors in the upper right corner of the front panel. Three switches provide flexible operation. They are for a.c. on-off, converter out-in, and range switching. The converter switch, second in from left in the front view, switches either the low-frequency antenna or the 7-Mc. i.f. output to the communications receiver. The range switch serves as its name implies, but also has a standby position that leaves the converter hot and ready to go, but with plate power off.

The rear view of the 126 shows the crystal-

controlled converters at either edge of the chassis with the 50-Mc. tunable converter mounted turret style at the center. It is worth pointing out that the r.f. and mixer tuned circuits of this converter are gang-tuned with the oscillator. This allows the use of moderately selective circuitry in the 50-Mc. front end, a factor that should be helpful in keeping down spurious responses from signals outside the intended tuning range. Uniform response across a 5-Mc. passband is thus achieved without the broadbanding that so commonly results in susceptibility to overloading from commercial signals in 50-Mc. converters using fixed-tuned circuits. — E. P. T.

More Mobile Power Supplies

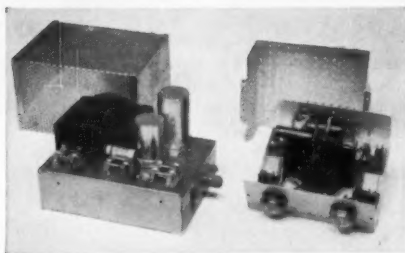
WITH the summer months approaching, mobile operating will take on a more attractive aspect. To help it along, a number of new transistor-type commercially-built mobile power supplies have appeared on the scene since last summer and have been reported in *QST*. To bring the mobile power supply picture up-to-date, here are some facts about a few more supplies now available for mobile use.

First, one important word of caution concerning transistor supplies: Some of these supplies are designed for a maximum input of 14 volts. However, many of the newer cars have their regulators set at the factory for generator outputs up to 14.6 volts. Although the difference is less than 5 per cent, a few moments of overload operation may destroy the transistors. If you are using a transistor supply that is rated at 14 volts maximum input, it would be a good idea to measure the voltage at the input terminals of the supply while the battery is charging. If under any conditions the voltage rises above 14, a dropping resistor should be placed in series with the "hot" lead. For instance, if the supply demands 10 amps., a one-quarter ohm (at least 25-watt rating) resistor will give a 2.5-volt drop. A suitable resistor could be made by connecting four one-ohm ten-watt resistors in parallel.

Transcon Mobile Power Supplies

THE Transcon power supply group includes types having output ratings ranging from 125 volts at 65 ma. to 600 volts at 200 ma. The photograph shows a Model H-600 transistor supply (on the right), which will deliver 600 volts at 200 ma. Output ratings on all the supplies are for continuous-duty operation. All models are designed for use with either 6- or 12-volt input. When operated on 6 volts the output voltages are approximately halved, although the current values remain unchanged. Also, it is necessary to change several resistors when operating the supplies on 6 volts since the units are normally wired for 12-volt input. The necessary replacement resistors are furnished with each power supply. The circuitry is insulated from the chassis so the units may be used with either positive- or negative-ground systems.

All of the transistor supplies use matched-pair transistors and silicon diode rectifiers. The rectifiers can be plugged in and are therefore easily replaced. Input and output connections are made through a terminal board mounted on the side of the chassis. The model H-600 measures 5 by 6 by 2 1/4 inches.

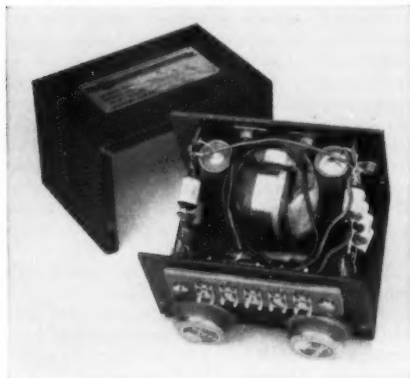


Transcon Mobilicon vibrator power supply (left) and 120-watt transistor supply (right).

The Mobilicon Vibrator Power Supply Model H-302 shown at the left is not much larger than some transistor supplies. It measures 5 by 7 by 5½ inches. This vibrator supply also uses plug-in silicon rectifiers. The supply furnishes 350 volts at 125 ma. under full load, and 200 volts when switched to stand-by. A built-in relay controls these output voltages. Output connections of the unit terminate at an octal socket. Low-voltage input leads connect to binding posts. Either 6 or 12 volts may be used to power the vibrator supply and it may have either a positive or a negative ground. Transcon power supplies are manufactured by Creative Electronics Corp., 94 Lincoln Ave., Stamford, Connecticut.

Kupfrian Transistor Power Supplies

THE Kupfrian series of transistor power supplies covers the power range of 50 to 225 watts. The 50-watt (250 volts at 200 ma.) is designed for 6-volt systems and the 100-watt models (250 volts at 400 ma., and 500 volts at 200 ma.) for 12-volt systems. The 225-watt model, unfortunately for hams, requires 28 volts input. The chassis is not connected to any of the circuit components, and the negative output is isolated from ground for convenience in making biasing

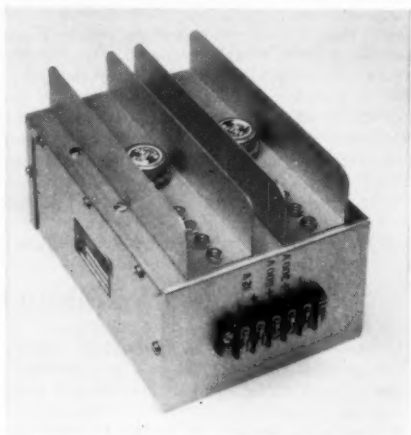


Kupfrian 100-watt transistor power supply.

arrangements. Input and output connections are made through a terminal strip mounted on the side of the chassis. The 12-volt 100-watt supply shown in the photograph measures 3 by 4 by 2½ inches. Kupfrian Mfg. Corp., 395 State St., Binghamton, New York, is the maker.

The Globe Model A12/600/200 Transistor Power Supply

THIS supply is designed to deliver 600 volts at 200 ma. or 300 volts at 400 ma. with a nominal input of 13 volts at 13 amp. It will operate at full output at temperatures up to 105 degrees F. Electrical connection to the power supply is made at the marked terminal board mounted on one end of the chassis. The case is insulated from the electrical circuits, and the input and output circuits are isolated from each other. This allows choice of positive or negative grounding of the unit. Plug-in silicon diodes are used for rectifiers.

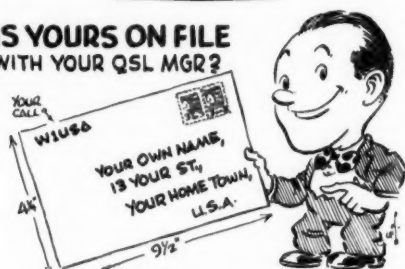


The Globe Model A12/600/200 transistor power supply. Aluminum channel fins provide additional area for cooling.

A 10-page instruction manual furnished with the supply covers principles of operation, maintenance, specifications, installation and schematic diagram. The Model A12/600/200 measures about 5 by 7 by 4¼ inches and is manufactured by Globe Industries, Inc., Belleville, New Jersey.

— E.L.C.

**IS YOURS ON FILE
WITH YOUR QSL MGR?**



Silent Keys

IT is with deep regret that we record the passing of these amateurs:

K1BKE, Robert L. Willard, Henniker, N. H.
K1CDH, Matthew Chess, Washington, Conn.
W2BGM, John E. McConnell, Brooklyn, N. Y.
K2EKL, Col. John H. Hinemon, jr., Little Silver, N. J.
W2FL, Dallas C. Akers, East Orange, N. J.
W2PPR, George W. Fremov, Rochester, N. Y.
W3AKT, Anthony K. Thornley, sr., Morrisville, Pa.
K3GGM, Alfred A. Markson, Pittsburgh, Pa.
W3OQQ, Gilbert H. Wogan, Hollidaysburg, Pa.
W4IGO, John M. Chamberlain, Sarasota, Fla.
W4NTT, Beverly D. Vaughan, Portsmouth, Va.
W5AIT, Virgil M. Santy, Hamilton, Texas
W5ALW, James W. Lewis, Mesquite, Texas
W6CNA, Rollins O. Plummer, Temple City, Calif.
W6QCK, Herman L. T. Bradley, Los Angeles, Calif.
W7ANZ, Donald C. Buckingham, Seattle 55, Wash.
W7CCB, Archie L. Bolstad, Seattle, Wash.
W7HX, Dr. Leslie Guy Van Slyke, Basin, Wyo.
W7KNP, Lewis K. Weiss, Phoenix, Ariz.
W7VKA, George F. Picand, Jacksonville, Oreg.
W8CCE, Rex K. Struble, Flint, Mich.
W8DAC, James R. Baker, jr., Tiffin, Ohio
W8LKL, Dr. Darrell B. Green, Athens, Ohio
W8SAN, Morris Krasof, Detroit, Mich.
W9FVV, James V. Lato, Chicago, Ill.
W9FWO, Thomas F. Vinson, Sioux City, Iowa
W9GXW, Paul Moffett, Concordia, Kans.
W9MAO, Jerome B. Cox, Lincoln, Neb.
G3GWI, Wilfred Steele, Nottingham, England
G12CIZ, Jim Gallagher, Belfast, Ireland
LA1D, Gunnar Hammerik, Oslo, Norway



25 Years Ago this month

May 1934

... Twenty-five years ago *QST* celebrated the 20th anniversary of the League. One quotation from the editorial is interesting. "Let us not be misled by those who . . . by planned misrepresentation are endeavoring to weaken our faith in our own selves."

... Then followed a sketch of two decades of technical progress in amateur radio, with five pages of fascinating pictures of representative amateur stations through the years.

... Then, by gosh, a 160-meter phone transmitter, described by W1TS himself, who has the same interest in phone today that he did twenty-five years ago.

... Next, a deluxe crystal-type single signal receiver, built and described by LeRoy Moffett, W9LJ.

... W1DF added an 830 amplifier to the three-stage transmitter, and housed the whole works in a wooden rack.

... W6CCR and W6FMG discussed the advantages of regeneration in the tuned r.f. stage as a means for increasing selectivity and sensitivity.

... There was a report on "the greatest DX contest ever staged," in which over 80 foreign countries participated.

... Al Jackson, W1NI, described a 500-watt transmitter "in the modern manner." It was an elaborate and advanced piece of construction. (1959 note — W1NI is still much in evidence locally, and his wife works in our circulation department!)

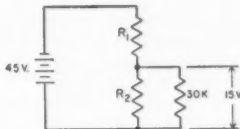
... W1EAO (now W1VW) brought the regenerative single signal receiver up to date with six tubes and preselection.

... Dr. Frederick Kolster discussed high-Q tank circuits for u.h.f.

... W1AL gave the technical specifications on Raytheon's new pentode screen-grid transmitting tube — the RK-20.

Quist Quiz

Martin Sonn, K1CKZ in Hartford, Conn., contributes the following: In the sketch below, it is known that $R_1 + R_2 = 15,000$ ohms. What are their values?



In last month's Quiz, closing S_1 allowed C_1 to charge to 100 volts. The charge is $Q = CE = 10 \times 10^{-6} \times 100 = 10^{-3}$ coulomb = 1 millicoulomb. When C_2 is connected across C_1 , by closing S_2 , the voltage becomes $E = Q \div C = 10^{-3} \div 15 \times 10^{-6} = 66.7$ volts.

To which W. B. Wrigley, W4UCW of Atlanta, Ga., adds this intriguing sequel:

1. When C_1 is charged to 100 volts, the stored energy is 50 millijoules ($W = \frac{1}{2}CE^2 = \frac{1}{2} \times 10 \times 10^{-6} \times 100^2 = 0.05 = 50$ millijoules)

2. "When things settle down" after S_2 is closed the stored energy in C_1 is 22.2 millijoules ($W = \frac{1}{2} \times 10 \times 10^{-6} \times 66.7^2 = 0.022$) and that in C_2 is 11.1 millijoules, making a total of 33.3 millijoules.

3. What happened to the 16.7 millijoules ($50 - 33.3 = 16.7$) of missing energy?

Strays

A floundering physics student defined a decibel as the number of marbles that would have to be dropped from the top of the Taj Mahal in order to equal the sound of a stampeding hippo.

K6GEF, operating on 15 meters, called CQ and signed with phonetics as K6 George Easy Fox. An irate neighbor, experiencing TVI, looked up George E. Fox in the telephone book and raised Cain with him!

The Radio Club of Scott High School, Toledo, Ohio, would appreciate any gear which anyone might care to donate to the club. — K8HWB.

While W7ROM was living in North Carolina (he's now KP4AMU) he obtained his W7 call letters on a North Carolina auto license tag.

PA0VO, writing on behalf of the Netherlands IARU society, reports that they are contemplating republishing their booklet on awards, and would like everyone who issues awards and certificates to send him particulars. Address PA0VO, Aalsterweg 277, Eindhoven, The Netherlands.



Hints and Kinks

For the Experimenter



LIGHTNING PROTECTION FOR VERTICALS

THE sketch in Fig. 1 shows a vertical antenna mounted above and in line with a ground pipe, thus giving spark-gap protection during electrical storms. The top vertical portion of the antenna is supported by stand-off brackets and held to these brackets by U-bolts. A piece of rubber hose or other insulating material is placed around the antenna where the brackets and U-bolts connect.

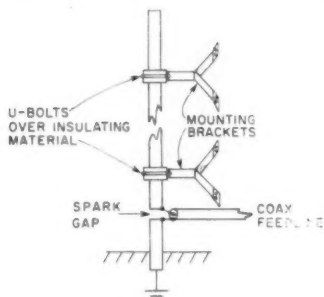


Fig. 1—Sketch showing the vertical antenna with lightning protection.

The spark gap should be set as close as possible, but not so close that it will break down with voltages encountered from the transmitter.

—Luke McCloud, K2DDM

R.F. ISOLATOR FOR D.C. METERS

OCCASIONALLY, fellow amateurs have come to me with d.c. meters that were in need of repair. It appeared that many of these meters were damaged by large overdoses of r.f. The owners reported that the readings weren't always consistent even when the meters were working. The reason for this inconsistency was probably the same — r.f. getting into the instrument.

The device shown in Fig. 2 will enable the user to measure safely d.c. voltages in circuits where r.f. voltages are present. It will also minimize the loading effect on the circuit by the meter.

The isolator consists of a series isolating resistance built into a probe and bypassed for r.f. When the probe is used with a sensitive d.c. current meter the series resistance can be calculated by using the following formula:

$$\text{Resistance (megohms)} = \frac{\text{full scale voltage desired}}{\text{full scale current value of the meter (in } \mu\text{a.)}}$$

Use two or three resistors in series to make up the total resistance; this will provide a longer r.f.

leakage path. For good r.f. isolation, ranges which require a series resistance of less than one megohm should be avoided. If a v.o.m. is used, it is easier to choose a scale that is already cali-

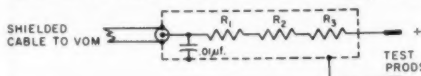


Fig. 2—Diagram of the r.f. isolator. Resistors R_1 , R_2 and R_3 should total the value found by the formula in the text

brated so that the voltage may be read directly from the old scale. I use the 0- to 60- $\mu\text{a.}$ range on my v.o.m. so that a 2-megohm resistor gives a 0- to 120-volt d.c. range.

—Stuart E. Bonney, WSJUV

INCREASING VIBRATOR LIFE IN THE ELMAC POWER SUPPLY

USERS of the Elmac M-1470 power supply may have noticed excessive sparking in the vibrator. This may be eliminated with a resulting increase in vibrator life by simply changing the buffer capacitors C_{16} and C_{18} from their original value of 0.1 $\mu\text{f.}$ to 0.5 $\mu\text{f.}$ These capacitors should have a 600-volt rating.

—Harry Stewart, WSPSV

NOVEL REGULATOR

REGULATOR tubes can't be paralleled directly to obtain greater current capacity because one tube will always ionize at a slightly lower voltage, thus preventing the other tube from firing.

The diagram in Fig. 3 shows how parallel operation of VR75s may be used without the usual equalizing resistors in series with each tube.

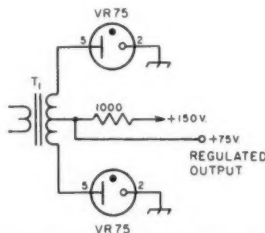


Fig. 3—WØDYW's voltage regulator.

The transformer T_1 can be any universal output transformer having a center-tapped primary. The secondary winding is not used. The d.c. resistance of the transformer winding is sufficient to accommodate the slight difference in operating potential of the two VR tubes.

—W. E. Witte, WØDYW

HEADPHONE ADAPTOR FOR CONTEST OPERATING

HERE's a gimmick that is useful during contest operating, especially on Field Day. The circuit is shown in Fig. 4. It allows two sets of headphones to be operated from one receiver; each channel has its own volume control.

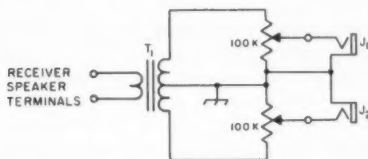


Fig. 4—Diagram of the adaptor. The transformer, T_1 , is a universal output transformer. J_1 , J_2 are phone jacks.

The transformer can be a universal output transformer. The voice coil winding is connected to the low-impedance output terminals of the receiver and the phones are on the push-pull winding side. The potentiometers allow for level adjustment to suit the operator/logger. Value of the pots is not critical; the ones shown just happened to be in our junk box!

The unit can be wired into a small minibox for easy transportation to the Field-Day site.

—Jack Cor, W0K.MV

CARRIER INJECTOR FOR PHASING TYPE S.S.B. EXCITER

WHEN using an s.s.b. phasing exciter it is sometimes desirable to inject some carrier without upsetting the carrier balance potentiometers in the balanced modulator. The diagram in Fig. 5 shows how this can be accomplished with a minimum of parts.

When the slider of potentiometer R_1 is at the ground end, there will be no carrier injection. However, when the arm is advanced toward the B-plus end, the circuit will become unbalanced

BALANCED MODULATOR

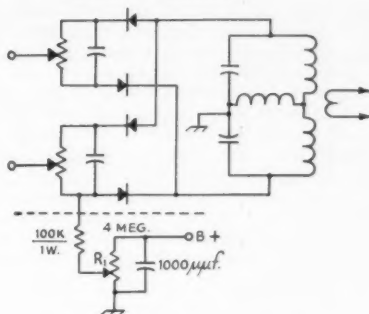


Fig. 5—Diagram of the carrier injector.

due to positive voltage applied.

Since the 100,000-ohm resistor is in the circuit at all times, a slight carrier unbalance will occur, but this can be overcome by a slight readjustment of the carrier balance potentiometers.

—W. Lane Tufts, K6JIV

REMOTE F.M. MODULATOR FOR V.F.O.s

THE circuit in Fig. 6 shows a six-meter remote tuned f.m. modulator and v.f.o. that makes use of the junction capacitance of a silicon semiconductor diode.

The v.f.o. consists of a standard 8 Mc. Clapp oscillator with the diode (CR_1) connected in the tuned circuit. The 12AX7 modulator is connected to the v.f.o. through a length of shielded wire.

When audio is applied across the diode, the junction capacitance varies and changes the frequency of the oscillator at an audio rate, producing frequency modulation. Deviation of the system is controlled by the gain of the modulator.

—Leonard Kudravy, K3ASU

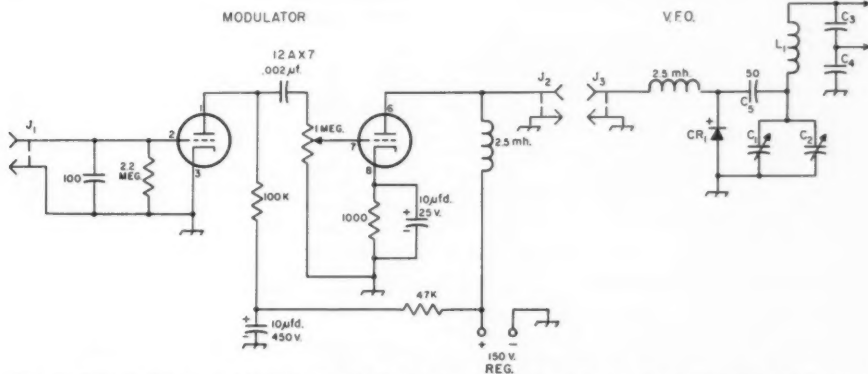


Fig. 6—Circuit of the f.m. modulator. Unless otherwise indicated, capacitances are in $\mu\text{f.}$, resistances are in ohms, resistors are $\frac{1}{2}$ watt. L_1 , C_1 , C_2 , C_3 and C_5 determine the frequency of oscillation of the Clapp oscillator.

C_1 —15 $\mu\text{f.}$ variable.
 C_2 —75 $\mu\text{f.}$ variable.
 C_5 —50- $\mu\text{f.}$ silver mica.

CR_1 —Westinghouse 1N1169 diode.
 J_1 —Microphone jack.
 J_2 , J_3 —Phono connectors.

FIELD-DAY ANTENNA MAST

SINCE not all Field-Day sites come equipped with trees of adequate height and spacing for antenna supports, here is a design for a light-weight, portable and easy-to-erect 40-foot antenna mast. The drawing in Fig. 7 gives most of the details. The carefully selected lumber should be free from knots and as straight as possible. The mast sections should be painted and then marked at the joints for identification when assembling. Guy wires are looped around the mast so that they can be removed easily and coiled for reuse. A four- or five-foot length of rope at the end of each guy wire facilitates fastening and adjustment.

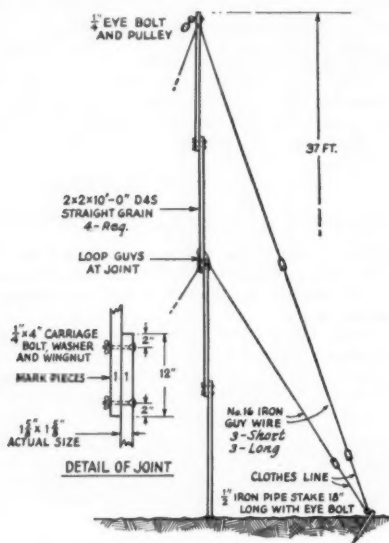


Fig. 7—Details of the Field-Day mast.

The mast sections should be bolted together and guys attached before erection is started. When raising the mast, two helpers on the side guys should steady the pole while another holds the back guy. When the mast is in position, the stakes should be placed at equal angles about twelve feet away from the base.

Two masts, when disassembled, can easily be carried on top of a car since they weigh less than thirty pounds apiece.

— L. A. Cundall, W2QY

CAR BATTERY REMINDERS

ALWAYS keep battery terminals clean and tight since corrosion reduces the charging current supplied to the battery by the charging system.

Periodically check system voltage with a voltmeter to make sure the generator is developing sufficient voltage. Look for excessive voltage drops caused by loose or high-resistance cables.

Check specific gravity with a hydrometer once

a month and recharge the battery if necessary. Add distilled water to the battery as required.

Check regulator setting after regulator has come up to operating temperature. Too high a setting of the voltage regulator is damaging to the radio, light bulbs, and ignition contacts. Too low a setting will allow the battery to become discharged.

SIMPLIFYING CARRIER NULL ADJUSTMENTS

I WAS not completely satisfied with the carrier null control on my Central Electronics 20A s.s.b. exciter, since it was rather difficult to adjust.

To obtain greater over-all resolution, I replaced the 1000-ohm carrier null potentiometers with 250-ohm linear potentiometers. I compensated the loss in resistance by adding sufficient resistance to the potentiometers. The resistance values added were obtained by measuring the resistance of the original potentiometers from the slider to each outside terminal (with carrier nulled) and then subtracting 125 ohms (half the resistance of the new potentiometer). I then used the nearest standard value resistor. In my case, this was two 390-ohm resistors on one potentiometer and a 470-ohm and 270-ohm resistor on the other.

This modification resulted in four times the resolution as compared with the original circuit. By using 100-ohm potentiometers, still greater "spread" should be possible.

— Joe Heumphreus, K6DXW

SQUELCH FOR HALLICRAFTERS SX-99

THE Hint & Kink in QST, December 1958, titled "Squelch Circuit for Hallcrafters S-85," will also apply to the SX-99 receiver. These receivers are quite similar in their circuitry, so I built the squelch exactly as described in QST and it worked perfectly with my SX-99.

For those interested, the price of all the parts for the squelch came to \$4.21.

— Donald N. Shrader, K3CCC

ADAPTOR FOR FT-243 CRYSTALS

THE popular FT-243-type crystal can be made to fit the 1/2-inch large-pin crystal sockets (such as those used in the ARC-5, SCR-522, or T11Z) by using the pins from an old tube base. Take any old tube that has the large-type pins, break off its base and remove two pins. Open the seam on these pins with a sharp screw driver or knife and slide them over the pins of the FT-243 crystal. Now the crystal with its new pins will fit the large wide-spaced socket.

— Francis LeBaron, W1TQZ

REMOVING PAINT FROM PANELS

ACETONE is useful in removing paint from a panel and chassis when a tight metal-to-metal r.f. seal is needed. Use only enough acetone to remove the paint in the desired area. Several applications of small "doses" on the selected

area seem to work better than a single soaking on the entire panel.

Acetone is flammable so safety precautions should be observed during the entire cleaning process. Also, avoid breathing the fumes from the acetone and do the cleaning in a well-ventilated area.

— Nelson Bigelow, jr., W5HQL

STABLE OSCILLATOR

HERE is a circuit which will be of interest to those who are experimenting with stable oscillators. The diagram in Fig. 8 shows the oscillator. The tuned circuit L_1C_1 determines the frequency of oscillation. Capacitor C_2 is a 50- μf . variable and is fairly critical in adjustment when the oscillator is first tuned. However, once set, it doesn't require readjustment throughout the tuning range of the oscillator — in my oscillator this was 3.8 to 6 Mc.

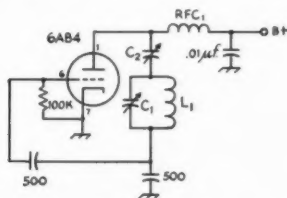


Fig. 8—Circuit of the oscillator. Unless otherwise indicated, capacitances are in μf . The tuned circuit L_1C_1 is tuned to the operating frequency.

C_2 —50- μf . variable capacitor.

RFC_1 —2.5-mh. choke.

I plan to add another triode as a cathode follower and to use the oscillator as a v.f.o. There are several points in the circuit from which the output can be taken but the best will have to be found experimentally.

— Clarke Redfield, K2DIG

RELAY POWER SAVER

MOST relays require only about $\frac{1}{3}$ to $\frac{1}{2}$ the initial closing current to hold them in the closed position. This fact can be used to reduce the size of the relay power supply.

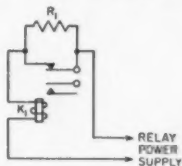


Fig. 9—Circuit of the relay power saver.

The circuit in Fig. 9 shows a current limiting resistor R_1 across a set of normally-closed contacts on relay K_1 . These contacts are adjusted to open when the armature is near the end of its travel. When these contacts open, R_1 is placed in series with the relay coil winding thus reducing the coil current to a lower value.

The resistance of R_1 can be calculated by using Ohm's Law.

— D. C. Mead, K2ZZF

MICROPHONE CIRCUITS

THE speech quality of a transmitter that uses a carbon microphone can be improved by substituting a crystal microphone. The diagram shown in Fig. 10A shows a 12AU7 crystal microphone preamplifier and cathode follower which feeds into the low-impedance winding of a carbon microphone transformer. Fig. 10B shows an alternate preamplifier circuit which will provide more gain for a carbon mike. Here, the tube is connected as a grounded-grid amplifier. The carbon microphone receives its operating voltages from the 12AU7's cathode current. If this circuit is used, it should be substituted for the part to the left of point "X" in Fig. 10A.

— H. J. Hoechstetter, W6UVM

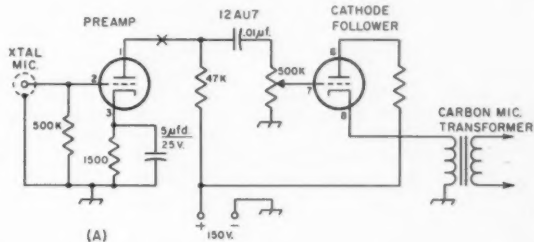
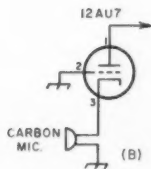


Fig. 10—Microphone circuits. All resistors are $\frac{1}{2}$ watt. The cathode follower plate load resistor is 47,000 ohms.



For posting 235,790 points and 1296 contacts, W4KFC (left) receives 21½-inch trophy from President W3EIS at recent Potomac Valley Radio Club meeting. W3EIS made the presentation on behalf of W3GJY, who donated this Raymond R. Rosenberg (W3NCJ) Memorial Award to the top scorer in the 25th Sweepstakes.



Three guesses who the top Four was! Cutting loose with 1296 QSOs and a blazing 235,790 pointer, W4KFC landed (1) the Virginia award, (2) the PVRC club award, (3) plaudits for top tally among the 1677 code entrants, (4) the W3NCJ Memorial Award donated by W3GJY. Vic was two QSOs and 500 points shy of W2IOP's 1298-236,246 killing in 1957, both of Larry's records thus continuing in force. Elsewhere in Four-land, Tennessee's K4LPW claims he's not getting any younger (who is?) but with 214,529 points worth fifth nationally, Mel scarcely seems doddering. K4HXF and W4BWZ rode roughshod over the Carolinas and W4WKQ, albeit slowed by queries from people who don't realize most of West Florida is on CST, won anyway. See East Florida and Georgia for nip and tuck skirmishes where, as always, the fellow who kept the most accurate dupe check, who waited to copy receipts for information sent, and who submitted the least illegible log, emerged with sheepskin to grace his walls.

K5DGI nosed out W5YDC in Louisiana last time but the tables were turned in 1958, YDC whomping up 191,625 on 14 Mc, alone, the highest one-bander of all time. Other Five-land highlights: W5FPI's powerful little 30-watter grabbed Mississippi and New Mexico's W5CK became one of two Stateside two-letter men earning a certificate. That K5LZO who triumphed in South Texas was none other than ex-KN5LZO, whose 1957 score of 37K still stands as best Novice work.

California has the Top o' the Mark, sunshine, more hams and ARRL Sections than any state, and movie stars. It also has a healthy share of contest stars, one being Sac Valley's young K6SXA. As a KN, Jim started off with the country's top score in the 1957 Novice Roundup, moved up to lead the Sixes in this SS. W6TT, a fan since the Thirties, took East Bay again 'though K6QHC pushed hard, while W6MVQ lost a toughie to W6UTV in S.C.V. Down south K6VTQ's 162,768 paced 62 L.A. entries and W6ZVQ fared famously in San Diego. Penned K6VTQ: "Please try to impress on the gang that QSZ is seldom necessary and only slows things down. Repeat *only* if requested."

Hearing a Seven, any Sweepstaker with ears

wide open for multipliers does a fast double take and cranks up the r.f. gain for a closer listen. The top W7 with 188,683, Las Vegas' W7KEV rolled his fifth straight "natural" in Nevada (maybe Baby needs a new pair of shoes) while neophytes W7YGN and W7YKT dominated Washington and Oregon. Wrote W7RGL: "A 440-watt rig, I've found, is about as handy during an SS as telescopic sights on a muzzle-loader! I'm also convinced that a traveler wandering through East Mass. couldn't go more than 17 feet in any direction before becoming snubbed up tight by assorted ham antennas. I'd have given my left arm (I'm left-handed) for a Maine come Sunday evening."

Like a highballing freight train, Ohio's W8LQA steamed over Eight-land with 198K. Meanwhile W8DUS's KW-1 was outdoing 50 Wolverines by



K6VTQ took Los Angeles entrants over the hurdles with 162,768 points and 921 contacts. President of Hughes Amateur Radio Club and ex-W2UZS, Ed favors DX, contests, experimentation and s.s.b.

kicking the gong to 111,399. And you could cry yourself a river over the grumbings at missing W. Va., except that W8s DIE FNI TDG and nine more were dishing out the section all over the place.

In W9/K9, W9RQM sprinted to a thirteenth consecutive Wisconsin victory by outmaneuvering K9CAN 198 to 187 kilopoints. Indiana belonged to W9YSX hands down and, believe it or not, somebody besides W9YFV and W9ERU finally captured Illinois.

W9YCR, as sharp an op as there is in the busi-

ness, clobbered Minnesota and the other Zeros with 209,328 points and 1153 QSOs, and ARRL Dakota Director W9PHR, coursing through 37 time-on-air hours at his habitual lightning pace, conquered South Dakota again. Out in Colorado W9CDP, testing a combination log-duplicate card-index system developed by W4KVX, found it a highly successful dupe-reducer. After defeating 35 Iowans, W9VXO weeped, "I've heard some hard luck stories but think mine takes the cake. During the contest I replaced the receiver rectifier tube and three 6146s in the transmitter.

C. W. WINNERS, 25TH A.R.R.L. SWEEPSTAKES

Section	Call	Score	Transmitting Equipment	Receiving Equipment	Bands Used
E. Penna.	W3JNQ	221,555	Ranger-813	75A4	80, 40, 20, 15
Md.-Del.-D. C.	W3EIS	217,266	Ranger-813	61J	80, 40, 20, 15, 10
S. N. J.	W2HDDW	157,413	DX100	HQ140X, Heath Q mult.	80, 40, 20, 15
W. N. Y.	W2SSC	185,603	Viking II	75A3	80, 40, 20, 15, 10
W. Penna.	W3ZHQ	142,355	DX100	8X100	80, 40, 20, 15, 10
Illinois	W9IRH	177,210	Viking II	8X101	80, 40, 20, 15
Indiana	W9YSX	146,183	32V3	75A4	80, 40, 20, 15, 10
Wisconsin	W9RQM	198,450	VFO-807-813	HRO50T	80, 40, 20, 15, 10
No. Dakota	K9CNC	106,760	VFO-6AG7-6146-807s	HQ100, QF1	80, 40, 20, 15, 10
So. Dakota	W9PHR	193,550	Pacemaker-814	NC183D	80, 40, 20, 15, 10
Minnesota	W9YCR	209,328	VFO-dlbrs-807s (5 separate finals).	Super Pro	80, 40, 20, 15
Arkansas	K5LNN	82,500	Ranger	RME 4350	20, 15
Louisiana	W5YDC	191,625	VFO-811As	NC183	20
Mississippi	W5FPI	134,959	TBS50	876	80, 40, 20, 15
Tennessee	K4LPW	214,529	HT32	8X101	80, 40, 20, 15
Kentucky	K4GEZ	174,652	Ranger; Valiant	75A4	80, 40, 20, 15
Michigan	W8DUS	111,399	KW1	75A4	80, 40, 20, 15, 10
Ohio	W8LQA	198,378	VFO-807-813	HQ129X, Q mult.	80, 40, 20, 15, 10
E. N. Y.	W2VCB	111,873	Ranger-4-125A	NC183	80, 40, 20, 15, 10
N. Y. C.-L. I.	W2AYJ	166,440	DX100	NC300	80, 40, 20, 15, 10
N. N. J.	W2DMJ	184,500	Subaco-75T; Collins VFO	HRO5	80, 40, 20, 15, 10
Iowa	W9VXO	191,430	DX100	HQ129X	80, 40, 20, 15, 10
Kansas	K9BJR	143,461	Ranger	HQ170	40, 20, 15, 10
Missouri	W9DR	142,808	DX100	75A2	40, 20, 15
Nebraska	W9NYU	131,488	Valiant	75A4, 8X25	80, 40, 20, 15, 10
Connecticut	W1FEA	180,000	VFO-exciter-6146-7094	8X101	80, 40, 20, 15, 10
Maine	W1DEO	71,175	Millen VFO-exciter-813	75A3	20
E. Mass.	K1CQO	149,455	Viking VFO-Viking II	75A1 (mech. filter)	80, 40, 20, 15, 10
W. Mass.	W1JYH	181,843	VFO-4-250A	Homebuilt	80, 40, 20, 15
N. H.	W1HKA	80,500	VFI-AT1	RME99	80, 40, 20, 10
R. I.	W1CJH	126,913	VFO-807s	75A1, Q5cr	80, 40, 20, 15, 10
Vermont	W1QCM	91,170	VFO-6AG7-6DQ6-813	Homebuilt (triple conv.)	40, 20, 15
Alaska	KL7CRE	55,725	Ranger	Super Pro	40, 20, 15, 10
Idaho	W7WMO	51,699	DX35	NC45	40, 20, 15
Montana	W7HAH	116,424	Valiant	HQ140X	80, 40, 20, 15, 10
Oregon	W7YKT	142,375	Navigator-1625e	HQ129X	80, 40, 20, 15, 10
Washington	W7YGN	167,353	DX100	NC300	40, 20, 15, 10
Hawaii	KH6IJ	104,609	HT32-4-250As	75A4	40, 20, 15, 10
Nevada	W7KEV	188,683	VFO-807-4-65A	HQ129X	40, 20, 15, 10
Santa Clara V.	W6ITV	156,768	VFO-4X150B	75A4	80, 40, 20, 15
East Bay	W6TTT	167,760	32V3	75A4	40, 20, 15, 10
San Francisco	K6OPI	126,000	HT32	8X100	80, 40, 20, 15, 10
Sacramento V.	K6SXA	193,633	Ranger	NC300	80, 40, 20, 15, 10
San Joaquin V.	W6VPV	69,513	10B-4X150As	75A3	40, 20
No. Carolina	K4HFX	138,361	HT32	75A4	80, 40, 20, 15
So. Carolina	W4BWZ	75,863	VFO-807-6BQ6	8X71	80, 40, 20, 15, 10
Virginia	W4KPC	235,790	VFO-807-4E27	75A2	80, 40, 20, 15, 10
West Virginia	W8DIE	129,500	VFO-Viking II	HRO	80, 40, 20, 15, 10
Colorado	W0CDP	133,020	Valiant	NC300	80, 40, 20, 15, 10
Utah	W7BAJ	100,909	DX100 (modified)	75A4	80, 20, 15, 10
New Mexico	W5CK	135,720	DX100	RME 4350	80, 40, 20, 15, 10
Wyoming	W7ABO	72,562	Viking II	HQ150	80, 40, 20, 15
Alabama	K4HPR	87,763	DX35	NC98	80, 40, 20, 15, 10
E. Florida	W4LVV	138,700	HT32-4-250A	HRO50T1	40, 20, 15, 10
W. Florida	W4WKQ	104,190	Lveco 600-813	HQ140X	80, 40, 20, 15
Georgia	K4BAI	116,830	VFO-106THs	SP400X	80, 40, 20, 15
West Indies	KP4AOO	43,792	Ranger; BC610 (14 Mc.)	8X71	40, 20, 15, 10
Canal Zone	KZSCN	98,340	Phasemaster 2A-P400 (g.g. amp.)	Collins R-390A	80, 20
Los Angeles	K6VTQ	162,768	20A-4E27s	NC300	80, 40, 20, 15, 10
Arizona	K7AII	97,020	Sig. Shifter (modified)-829	BC342 (conv. 15) HC10	40, 20, 15
San Diego	W6BVQ	158,330	5100	75A3	40, 20, 15, 10
Santa Barbara	W6ULS	114,245	HT32-PL172	75A1	40, 20, 15, 10
No. Texas	W5MCT	153,810	VFO-Viking I	NC303	40, 20, 15, 10
Oklahoma	W5YJS	114,835	32V2	75A3	80, 40, 20, 15, 10
So. Texas	K5LZO	156,690	HT32	75A4	40, 20, 15, 10
Maritime	W2ZRX/VO1	44,672	Pacemaker-4X250Bs	75A4	20, 15, 10
Quebec	VE2ADD	49,445	VFO-6AG7-6N7-6146-813	NC125	80, 10
Ontario	VE3UOT	130,889	Pacemaker-Thunderbolt	75A1, Q5cr	80, 40, 20, 15, 10
Manitoba	W3MCG/VE4	72,720	KWS1	51J4	40, 20, 15, 10
Saskatchewan	VE5VP	48,454	6AG7-6L6-807s	876	40, 20, 15
Alberta	W7PSO/VE6	42,210	HT32	75A3	80, 40, 20, 15, 10
B. C.	VE7JO	87,675	6AC7s-6L6-813	Homebuilt (double conv.)	40, 20
Yukon	VE8JW	108,186	DX100	HRO60	20, 15, 10

Murphy's Law, which loosely defined means "If anything can possibly go wrong, it will," received initial QST mention in connection with the generator-weather-equipment troubles that normally keynote Field Day participation. It must now be conceded, however, that M.L. may strike even the comparative safety of the home shack, especially during contests. How many applications can you spot in Gil's cartoon? The law also explains why your first-born, your mother-in-law, or those friends unseen in 20 years arrive while the SS is on. Other grouchings appear in Soapbox.



My E-bug was sticking and I burned up two 6AH6s and an assortment of resistors in the t.r. switch. To top it off, a neighbor chopped down my 40-foot wooden tower the eve of the second week end." Another Murphy's Law tale comes from W0ATA: "Had to race to the hospital at midnight the first Saturday to beat the stork with our first-born, and my mother-in-law came the second week end to live in our small apartment. Tell the boys who had equipment failures they were fortunate." You boys who had equipment failures were fortunate.

Pumping the key at University of Toronto's VE3UOT, VE2NI relied on a 750-watt Johnson rig to amass 899 QSOs and 130,889 points and lead the VE VO bunch on both counts. VE3DSU's 115,575 and VE8JW's 108,186, latter registered in chilly Whitehorse, rounded out Canada's six-digits. Just VE3UOT and VE7CQ qualified for the perfect multiplier of 73. Clunker calls notwithstanding, Yanks W2ZRX/VO1, W3MCG/VE4, W7PSO/VE6 mopped up in three of the eight Dominion Sections.

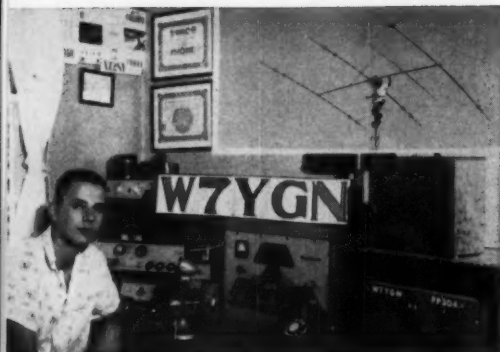
In the Possessions, renowned contester KH6IJ seized Hawaii with 104,609 points, KZ5CN got 98,340, KL7CRE 55,795, KP4A00 43,792.

Sorted by descending order of score, the code leaders line up as follows: W4KFC 235,790, W3JNQ 221,555, W3BES 220,643, W3EIS 217,266, K4LPW 214,529, W0YCR 209,328, W3GAU 204,583, W3GHM 201,028, W9RQM 198,450, W8LQA 198,378, W3ALB 196,370, W3FYS (multiop) 194,185, K6SXA 193,633, W0PHR 193,550, W5YDC 191,625, W0VXO 191,430, K5DGI 188,888, W7KEV 188,683, K9CAN 187,793, W2SSC 185,603, W2DMJ 184,500, W3KLA 184,051, W9LVR/9 183,230, W3TMZ/3 (he got married and moved) 183,060, W3AEL 182,880, W1JYH 181,843. For statistical kicks, howdja like to have those 26 in your club?

A record 104 sharpshooters landed the 73-section perfect multiplier: W1s BIH BOD DEO EOB JSM JYH UBC VG, W2s AYJ EMW FZY GND GSJ NOY PRE SSC VCB, K2s CPR IAD LGN OMT, W3s ALB BES BQA CPS DBX EIS

These two yearlings give early promise of becoming SS VIPs. At left is KN5PFL of Southern Texas, the contest's top Novice scorer with 31,608 points and 270 QSOs. On the right we have Indiana's KN9PDH whose 19,635-pointer ranked second among the WN/KN/WV clan.





In the Northwest, W7YGN (left) walked off with Washington while W7YKT (below) was performing identically in Oregon. The youngster's score-contact totals were respectively 167,353-933 and 142,375-861.



EQA EVW FYS GAU GHM GQF GRF GRS
HHK IYE JNQ KLA KT LEZ MFJ QMZ VAN
WG WJD WSF WV, K3s CBQ CIO CYA GUR,
W4s CVI GF JAT KFC LVV PRO RPZ RQR
ZM, K4s GEZ LPW, W5s DRW FPI YDC, K5s
DGI JZY, W6s HOC JVA ULS UTV, K6s GS
SXA, W7s PQE YGN, W8s DQG LQA RSW
SDJ TJQ ZJM, W9s DYQ PDX GFF GRF
KLD KXK KZZ LNQ LVR/9 PZT YSX ZAB
ZRG, K9s CAN ELT, W0s CXN FZO TDR
YCR, VE3 3UOT 7CQ, KH6IJ.

Here are the 24 Novice winners: KN3DJN
KN2JXF KN9OUU KN9PDH KN9LWV
KN0OLM KN0QMU KN5RFL KN5OPM
KN4UHH KN8KNT KN2QBD KN2POB
WV2BDV KN0PVJ KN1HTV KN1GTW
KN7CEO KN6ROU KN4SSM KN5OWH
KN4ZRZ KN6TUN KN5PFL.

Soapbox

"It was interesting to see what could be done when the rig held together for a change. Put on the wrong antenna sometimes but this made no difference to KH6IJ and others as conditions were sizzling hot. Didn't beat the bushes for KP4AIO on 14 Mc. and paid for it. One Idaho in 8 SS's. Next year I'm going to have an antenna that will singe the trees here!" — W1RAN.

"Hope I did better than in '57 when I was 1346th nationally, hi. Happy to hook W0BLZ and W3GAU for my 47th and 48th states." — K0HCP. . . . "My log represents ten hours and two minutes of the most fun I've had since becoming a ham in January, 1958. It also represents one tired fist (a straight key is no match for a bug no matter how fast you can send), one tired finger (the log had to be typed), two ringing ears and one splitting head (I've just gotta get a looser-fitting pair of earphones).

Thanks for sponsoring this worthwhile activity which builds such high-ranking proficiency." — K2KUA. . . . "500 QSOs and no Maine! My head hangs in shame. Sob." — W1MIX. . . . "Why must those long lost friends call on a guy just on those two week ends?" — K0PML. . . . "Been punching at the 88 since '32 when I won in E. Pa. One of these days I'll crack the 1000 mark and retire." — W3ARK. . . . "My mother showed unprecedented interest in ham radio by asking, 'When's this thing over?'" —

W6UQC. . . . "This rat race gets better and better but even with Operating Aid Six I goofed on a few. WOE is me!" — W2WOE.

"I jumped to 82,500 points over my '57 Novice score of 426, but filling out the log was a most unpleasant task. I made 22,500 above my goal and in '59 I'll try for more. Thanks for making this wonderful contest possible." — K5LNN. . . . "Last time I had 91,433 points, recopied the station log into smooth form in many evenings of longhand, then forgot to mail it! That explains the carbon copies." — W8TJQ. . . . "What a contest! After several phone tries this is my first c.w. entry and by far the best of them all. How else can you land WAS and 69 sections in four days of one-band operation? Twenty meters was really fantastic. Hats off to the ARRL Staff for making this marvelous event possible!" — K2BWR. . . . "Last one for a while due to college. I squeezed about everything out of the 1625s but not enough to equal the all-band boys. Conclusion: It can't be done on 80 and 40 alone." — W8FNI. . . . "Really had a ball working every state except Vermont. With 30 watts, ten and 20 came through with the western sections to improve my '57 score by 233 per cent." — K2UZZ. . . . "To keep an accurate account, I used a spare electric clock plugged in only when actually operating. I've never before heard of this method. Is it odd stuff?" — W9FDX. . . . "I had hoped to work all 73 and score 100,000 and, this accomplished, I am retiring (until next year). The Frankford Radio Club issues a certificate for working 25 of its members. Checking my log for the few needed to qualify, much to my surprise I found a total of 27 of them contacted on c.w. I think Frankford should be commended for being such an active organization of topnotchers." — W3BQA.

"Thought I'd dabble around and perhaps pick up the few remaining states but soon I was completely engrossed in the spirit of the thing. The operating tactics on 14 Mc. were swell. Though a ham since '38 and a commercial air-line of five years, I learned many new tricks. A wonderful experience." — W5HHE. . . . "QRP disappointing on 20 but 40 was fabulous. Never again without perfect one-switch control." — K6BEP. . . . "Where was New Hampshire? More than doubled the '57 score due to more time and sections and better operating position but noted little QSOs-per-hour improvement. The Tattoo (a break-in system, August 1956 QST) functioned FB. Now if I can just double my score in '59 and again the year following!" — K9DWG. . . . "I found out right quick that the 88 is no place for an SW-3." — K0DCP. . . . "Starting a 700-calorie diet two days before does not make one sharper. H.v. arc in nearby TV set killed my communications receiver good." — W6VNG. . . . "Really enjoyable although quite a change from my Alaska operations. Surprised at the performance of the 25-watt portable rig in picking up 37 states toward WAS at the new location." — W4AMP

(ex-KLTBP). . . "Didn't break any records or come close to the leaders but got some real operating pleasure. Expect to enjoy many more of these annual band-scramblers." — W2OWX. . . "Spent as much time filling out the sheets as operating. Would like a robot logger for the next one." — K4MUP. . . "Not much homework got done but it was the best SS in my three years of experience. Signs clean and operators excellent." — K8QIX.

"Since '54 as WN0TDR I have participated in each SS. Working all 73 this time has given me a thrill I'll never forget. QST back issues reveal this has never before been done from Missouri so don't blame me if I throw out my chest a little. The first week end was devoted to trying for the harder sections on 15 and 20; the second, with six states and West Indies lacking, mainly to 40 where more QSOs could be made. When W3HHK told me about KV4AA I immediately shifted to 14 Mc. to land the 73rd. Eureka! A suggestion: With scores increasing tremendously each year, one week end should be ample. Surely more ops would participate except that they cannot escape one of two periods. I really believe it would improve competition among the top c.w. men." — K2LZW. In 48 ARRL announced an SS so patterned but did a fast reversal after cries that: (1) score-contact-club totals would no longer be comparable; (2) year-to-year improvement wouldn't be measurable; (3) an ionospheric disturbance might wreck the SS for everyone; (4) chances of grabbing all sections, a popular side project, would be decreased, as would the newcomer's WAS opportunities; (5) no one need kill himself with a maximum 40 of

with v.f.o. and a 21-Mc. wire with s.w.r. better than 27:1. Now back to the relatively quiet life of chasing DX on 40 c.w." — K2UBW. . . "There should be few complaints about North Dakota activity with W0EOZ making over 500 QSOs, K6CVC 200, W9NLJ/0 'DXpeditioning' here, and my greatest effort so far. Happily, Murphy's Law was not in effect. My beautiful 50-foot pole did not collapse until the day after the SS in an ice windstorm. Operating seemed better but there is still much time-consuming, unnecessary repetition." — K0CNC. . . "Would have broken 100,000 but had to QRT the final night to study for calculus exam. These contests are rough on engineering students." — W4HBB (W4JLV op).

"When November QST arrived I immediately ordered a v.f.o. sent special delivery (bless the Heath Company for fast service!) and finished adjusting it minutes before. Still haven't put all the screws in the thing. Took an hour off for church where they had trouble with a ciphering pipe organ. Could have sworn it went 'dahdidididid dahdidididid: dididididid' during the sermon." — W2SXV/S. . . "Even with many difficulties, including equipment malfunctions and hooking K7AXO on his CQ DX for my 73rd, I still find the SS one of the most stimulating and challenging of the many ARRL activities." — W3WJD. . . "Heard several stations giving numbers around 1000 early Sunday p.m. so there should be some whopping, record-breaking scores. Was especially pleased to work W7BAJ and W7HRM to finish WAS and KX6CW for a new country. Now if they only QSL! — K2DXV. . . "While everyone else was smoking and drinking coke and coffee, I went through one lb. of cookies, one lb. of mixed nuts, and $\frac{3}{4}$ lb. of candy. Thanks to all those who repeated preambles while I munched noisily." — K6RFT. . . "Have been in nearly every one of the 25 holdings and this one seemed to be a peak for activity with operation around the clock on 14 Mc. and even 21 Mc. adding to the totals. Often before I have missed only one section but for the first time I got them all. Not the distinction it used to be, perhaps, but still very gratifying to me." — W3LEZ. . . "The goal was 100,000 with 50 watts and was going great until I took a short rest, forgot to set the alarm, and slept through the last five hours of the contest." — W1KGI.

"Since I use a kw. all year and if they don't come back the antenna has fallen down, I thought it might be more sporting to enter with my HT-18 v.f.o. which puts out 1.3 watts on 28, 14 and 7 Mc. and 1.8 watts on 21 Mc. Antennas are dipoles and 28- and 14-Mc. beams. Working with a peanut whistle calls for perseverance and an entirely different technique.

1. Look for stations just finishing an exchange and sending a fast QRZ. It's a waste of time calling CQ or answering a long CQer.

2. Answer the stronger stations.

3. Best results are obtained during the waning hours when the big guns are searching around for contacts.



A score of 184,500 netted Northern New Jersey plaudits for W2DMJ. Frank has signed that call since '31, is active in RACES and other civil defense work, and may be heard on the bands 160 through 2, c.w., a.m., p.m. and s.s.b.

the 66 stretch usable, 26 hours remaining for sleep, chow, church, family, etc.; (6) no one has to operate 40 hours anyhow; (7) the tabulations carry a time-on-air figure enabling those unable to work full time to make their own comparisons; (8) the 'wheels,' many of whom average over 40 QSOs per hour at the start, would probably win by a larger margin in a shorter contest. — W1ZDP]

"I seem to have survived my first SS. A poor receiver, a sick v.f.o., an ailing transmitter, stirred up with a great deal of school work doesn't mix into a cocktail befitting a decent score. Even managed to goof up my serial numbers. The summary is correct and true 'though (I hope). Will be improving the station and looking forward to many more SS's." — K6SXX. . . "Started out searching for all sections but simply couldn't resist answering all those CQs." — K5IDZ. . . "Everything FB except for a tube socket falling apart and a receiver bandspread failure forcing use of the 1:1 direct drive. Crystal control doesn't help a person win either. Hope to give the boys a go in the future

British Columbia went to VE7JO and his vertically-oriented station. Art doffs his hat to the many fine operators contacted, noting "speed with courtesy seemed much in evidence this year." How many OTs recognize that piece of gear in the upper right corner?





(During the opening two hours I almost lost faith. Beaucoup calls, no answers.)

Biggest thrill was raising KX6CW on ten meters. Had the time of my life." — W3KDD.

"Pushed for 100,000 but fell short because of various operating inconveniences. Need right and left foot pedal switches, a gross of right-handed pencils and a left-handed bug." — W6PZH. . . . "The rig did a respectable job but it became obvious a t.r.-switch and more comfortable operating position were required. The old back and seat got awfully tired and the call K0KWR/0 was a real killer. Worked 45 states and 61 sections but just couldn't find Miss., W. Va. or Vermont. Hope to double the score and take Missouri in '59." — K0KWR/0. . . . "Good practice at copying through QRM but why do some Generals park in the middle of the Novice band and block the whole works? Great fun anyhow." — KN0LM. . . . "A delightful SS, because I finally hit 73 sections after four years of trying. For me with a measly (by Potomac Valley Radio Club standards) 666 contacts it was a maximum effort. Some day I'm going in one of these things just for the fun of it and not because a gavel is hanging on each contact." — W4ZM. . . . "It was my first SS and I was amazed at the amount of interest. I will be back with a v.f.o., more power and a bug. Never again with a straight key!" — K8LUS. . . . "My second try in the king of all contests. Score of 43,313 was a sharp improvement over '57's 630 points." — K11PI. . . . "How about an extra multiplier for us high school kids who have to explain sleeping in class to the teachers?" — K4DAS. . . . "W4KFC told me once that anyone who goes over 900 contacts in the SS is somewhat nuts. He was right." — W1JYH.

"My age is 11. Am I the youngest ham to get over 4000 points?" — K2MIG. [No. Ten-year-old KN2POB took the N. Y. C.-L. I. Novice certificate with a score of 10,050. — W1ZDP]. . . . "Be back with General and v.f.o. to quadruple my score." — KN3DJN. . . . "Sincere thanks for every fun-packed minute and will return in '59 to break all existing records!" — K2IMK. . . . "After a certain Novice had sent most of the dope I asked him for the date. He came back, 'Don't you have a calendar?'" — W4BUU. . . . "One crystal, five watts output, a loose antenna connection and lots of QRM = 135 points. Do I qualify for the booby prize?" — KN8MGK. . . . "I used the two-tube regen and the one-tube 25-watt 80-meter rig which I built from instructions in *How to Become a Radio Amateur* and one 3645-ke. crystal. I don't claim any outstanding record but it does show that something can be done with a very simple outfit. Novices, take note." — K0JPS. . . . "Where was W9IOP?" — K1CCA. . . . "Just stick around long enough and Vic (W4KFC-W1EOB-W1TYQ) tory will be yours." — W3UE. . . . "Recommend that smokers keep a candle burning at the operating position to permit light-up and avoid nicotine fits during QSO." — W1FGP. . . . "No big score but had fun trying and won't miss another. Some day hope to beat W8LQA." — K8GWK. . . . "Absolutely no assistance, no spotting, no logging, no telephone help, no intercom. This vehement insistence on 'no help' stems from one poor loser's increasing suspicions

W0YCR administered a 209,328-point shellacking to Minnesota contenders, became the first Zero to transcend 200K. Bill owns five completely bandswitched 150-watt finals, two 807s in each, and a very pretty fist.

that some of the brethren are not playing the game fairly. It is supposed to be a hobby." — W3CPS.

"This is a U. S. A.-Possessions-Canada contest. Every one of these locations can be contacted on 3.5 or 7 Mc. Why clutter up the DX bands of 14, 21, and 28 Mc. with Sweepstakes garbage? I can also well imagine what some DX stations think. No wonder you can hear them call CQ NO W. After hearing the rat race we call a contest, they think we are nuts. I'm not too sure they haven't got something there." — W9ABI. . . . "Once a year it doesn't hurt anybody to go wacky, so please ignore the bluenoses and set up another madhouse in '59! Suggest a multiplier of 0.5 for anyone who uses a CQ SS longer than 3×3 . These 20×10 calls drive us all batty. On second thought no 0.5 multiplier is needed. Long calls are an automatic score reducer." — W3NNL. . . . "Fabulous! Had a ball. Let's have more contests. How about having the SS twice per year?" — K2PGB. . . . "I wore right through the paint on the panel where the transmit-switch is. Never again without full break and a foot-operated v.f.o. spotter-switch." — W3YDV. . . . "KL7, Ark., S.J.V., Wyo., Idaho, Sask. seemed scarce. Pulled VE5YJ off ten phone for number 73, then after all that effort worked VESDZ an hour later on 14 Mc." — W9KLD (ex-KL7CDF). . . . "What a pile-up on VE6NXI!" — W3UGV. . . . "I don't know why but this one just didn't appeal to me. Murphy and his law didn't even show. Think I'll stick to Field Day and CD Parties." — K9JIN. . . . "Copying the log is a large job but necessary after the flop of the carbon-copy method last year. Too messy." — W3GYP.

"Never had so much fun. I made more QSOs in this SS than in my whole Novice year!" — W2RZK. . . . "I got all shook up when I got 589 from F8MG on 40 with only ten minutes SS time lost. Too bad France isn't a section. When I have my General and v.f.o. you will see some sparks fly, hi hi. 73 and long live the SS!" — KN1HTV. . . . "A good example of the power-*vs.*-multiplier argument is the result between W9WWA and myself. We both operated the limit, and with a kw. I had 155 more QSOs than he but was edged out with the multiplier afforded his DX-100. I'm not griping. In fact, it was so close I think the 1.25 multiplier is just about right." — K0ITF. . . . "Two terrific week ends. Conditions, especially on the higher frequencies, were about as good as one could ever hope for." — W9KZZ. . . . "This year I kicked the OM (W1SAD) off the air and had the rig to myself. The score proves he is the better op so next year he gets the rig." — Marie, W1COL. . . . "Please place more emphasis on keeping a running check list to eliminate time lost in replying to stations already worked. Can't a penalty system be set up for such actions? Some called me four and five times. Despite my efforts, one duplicate still crawled into my list." — W0CXN. . . . "Spent too long digging for sections to run up a big score but got all 73 for the second time in a row, this time on 14 Mc. only. Conditions were excellent and QRM terrific, especially with my ancient receiver." — W2EMW.

"Boy, what QRM. 'Twas wonderful. On 40 the band was solid six deep for hours on end and don't know how some guys were able to pull 'em out of the mud. As usual the most consistent signs were W4KFC, W3TMZ/3, W1JYH, W1EOB, W3BES, W3GHM." — W2GP. . . . "Worked 72 sections the first period and without prearrangement got S.C. in the first eight minutes of the second leg, although I had a 9 p.m. skew just in case. No one runs up a score by looking for sections." — W2FZY. . . . "Wonderful conditions prevailed throughout. Until late the second Sunday thought Arkansas had seceded from the Union, hi." — W1HKA. . . . "How could I ever miss Idaho when it's so close!" — W7LEV. . . . "It seems that any time I try this contest we have hurricanes, plumbing or power failures, dry wells, lost antennas, poor connections in the setup, etc. This one was no exception. Had a terrific blow and lost a 45-foot 4 × 4 mast and was feeding 100 watts of

W3JNQ relaxes happily after grueling battle for Eastern Pennsylvania and Frankford Radio Club certificates and second high national tally. Licensed since '41, Dick likes contests and DX, is presently E. Pa. Section Communications Manager.

r.f. into the Atlantic Ocean for an hour. Was wondering why I wasn't making any contacts. Those pi-nets will load anything, even the ocean." — VEIAR. . . . "Guess I will never get too old to enjoy the SS. Bought a new HQ-170 the day before and learned to use it during the contest. Now a decent antenna and maybe the fellows will hear me better." — W9WEN. . . . "Swell contest but missed the clean sweep again. Where was S.C.? How about SCMs in some of these hard ones stirring up some activity?" — W6CIS. . . . "1956, 'way down in Connecticut; 1957, 12th; 1958, 4th or 5th? Worked 81 W4/K4 stations but no S.C." — W1ECH.

"The way everyone kept away from us, we must have B.O. Were there any other father-son teams on?" — KN3DUX and KN3DUY. . . . "An orchid to W3MCG/VE4 for the Manitoba multiplier and my nomination for the worst call." — W7QLH. . . . "The best yet, with good conditions and competition sharp. We should have these SS tests twice a year." — KH6HAA. . . . "Will return with new receiver and antenna farm for top score or bust!" — K8HLE. . . . "When I snagged Idaho for my 73rd it made all the time spent on 20 and 15 worth while. Pleased with the general high level of operating but some stations had bad clicks." — W2GSJ. . . . "The newcomers certainly should be commended for their fine operating. A great turnout of Novices." — W8ZAU. . . . "Got Wyoming for my 48th." — K2QYL. . . . "Since I couldn't be on the first week end, thought it might be interesting to try for 73 sections in 73 QSOs. It was!" — W6HOC. . . . "My first contest of any kind and even though I made a poor showing, judging from some transmissions heard others did worse. I was 'forced' into it because joining was the only way to get a contact. Once in there was nothing left but to continue. Believe techniques were learned which will help with the next one. While working as a General will be fine, the competition will surely be tougher. I'm game to try anyhow." — KN3DIJ. . . . "Poor planning. The XYL delivered a baby boy the second week end!" — K3CBQ. . . . "The 25-watt QRP made the going slow but got my 25 w.p.m. code proficiency sticker as a result." — W3HRE.

"It's over, thank goodness! My legs are frozen from the basement floor and there were too many interruptions. Three sick kids and I spent three days in bed with flu between week ends. 'Twas as rough a one as I ever went through. Never again, till the next SS!" — W9RCJ. . . . "One day I will finally take W.N.Y. I am 16 and have scored 100K twice already. With secrets stolen from JNQ, IOP and others, I expect to break 7 or 8 million soon." — K2MWK. . . . "Wow, what a contest! Insofar as I can tell I'm about 6th in the section and here I went and got me over 1000 QSOs. The harder you chase the Md.-Del.D.C. gang, the faster they run. Guess my only hope of winning an award is to move back to W8-land." — W3KLA (ex-W3QOL). . . . "FB conditions throughout. Now let's try to pick a comparable week end for ARRL Field Day some time." — W8OYI. . . . "Celebrated my 25th anniversary in ham radio during the 25th SS. My only suggestion is that some special dispensation be given us 'poor preachers' who find the contest coming at the busiest time in our week. Perhaps a special multiplier of ten or an extension including some midweek holiday or a letter to our congregations advocating off-time in November would help. Seriously, I enjoyed every hectic moment. I learned how rusty I was at message procedures and how unskilled at rapid sending, but rediscovered the fact that amateurs are among the most completely cooperative human beings alive. Congratulations to ARRL on this one of many outstanding contributions to the hobby. I hereby promise not to wait another 25 years before loosening up the fist and burning the midnight oil." — W8JUP.

The final tabulations of phone and club winners are now being prepared. We'll spill the beans in June QST.



C. W. SCORES

Twenty-Fifth Sweepstakes Contest

Scores are grouped by Divisions and Sections. . . . The operator of the station first-listed in each Section is award winner for that Section unless otherwise indicated. . . . Likewise the "power factor" used in computing points in each score is indicated by the letter A or B. . . . A indicates power up to and including 150 watts (multiplier of 1.25, c.w.), B over 150 watts (multiplier of 1). . . . The total operating time to the nearest hour, when given for each station, is the last figure following the score. . . . Example of listings: W3JNQ 221,555-1215-73-A-39, or final score 221,555, number of stations 1215, number of sections 73, power factor of 1.25, total operating time 39 hours. . . . An asterisk denotes Novice certificate winners in sections where at least 3 Novice logs were submitted. . . . Multioperator stations are grouped in order of score following single-operator station listings in each section tabulation.

ATLANTIC DIVISION

Eastern Pennsylvania	W3MFW. 144,540- 803-72-A-34
W3JNQ. 221,555-1215-73-A-39	W3LEZ. . . 143,080- 785-73-A-31
W3BES. 230,643-1210-73-A-40	W3WJD. 131,856- 725-72-A-37
W3CHM. 202,028-1107-73-A-38	W3KFK. 131,400- 730-72-A-35
W3ALB. 196,370-1078-73-A-40	W3EQA. 129,210- 716-73-A-30
W3CPS. 169,543- 960-73-A-38	W3KPT. 128,115- 702-73-A-31
W3HHK. 158,501- 869-73-A-39	W3ARK. 126,822- 920-69-B-38
W3MWC. 146,970- 834-71-A-40	W3WKN. 124,100- 730-68-A-39
	W3GYP. 121,958- 707-69-A-40
	W3BQA. 110,230- 604-73-A-53

Using only 14 Mc., Louisiana's W5YDC ticked off 1063 exchanges in 73 sections for 191,625 points and all-time high W5 and one-band score. Novel QSL display features SS cards sorted by ARRL Divisions and Sections.





Rare multipliers were dispersed by two former W's now hanging out in the Possessions. Left is KZ5CN, who was able to borrow those two snazzy Collins R-390 receivers for the contest. KL7CRE, the gentleman above, a Philco TechRep in Alaska, was snapped studying his SS QSLs. KZCZ5CN is ex-WØMVH and KL7CRE ex-W8FGA.

W3GRS 110.048- 603-73-A-31
W3EAN 109.624- 640-69-A-31
W3AFF 108.290- 641-68-A-39
W3LOQ 108.275- 610-71-A-34
W3HGH 107.920- 608-71-A-32
W3SOH 107.610- 604-71-A-30
W3DQO 108.080- 592-71-A-40
W3EYV 95.813- 525-73-A-34
W3IXN 91.770- 532-69-A-35
W3DWE 92.565- 563-69-A-30
W3VDV 91.350- 653-70-B-39
W3EER 91.120- 536-68-A-30
W3ADZ 90.880- 512-71-A-24
W3HHA 89.278- 533-67-A-40
W3DVC 77.089- 507-61-A-28
W3KDF 75.815- 514-59-A-23
W3HSE 74.800- 440-69-A-34
W3GRD 74.200- 530-56-A-35
W3NKL 73.048- 482-61-A-30
W3C88 71.190- 532-63-A-19
K3ALD 68.000- 400-64-A-32
W3RCV 65.993- 419-63-A-31
W3YLL 63.500- 411-62-A-36
W3DDX 63.510- 348-73-A-37
W3DAO 63.350- 362-70-A-32
W3GOQ 60.548- 351-69-A-36
K3DKC 56.695- 396-36-A-35
W3C88 55.025- 310-71-A-22
W3FHR 54.960- 341-64-A-40
W3VHK 53.763- 391-55-A-36
W3BYN 50.320- 296-68-A-31
W3NHN 46.020- 312-59-A-32
W3DQO 46.020- 272-63-A-21
W3ADE 40.020- 276-68-A-18
K3AIT 40.000- 400-40-A-20
W3BFR 36.000- 300-60-B-21
W3FAF 34.480- 255-48-A-17
K3NOH 33.600- 280-48-A-8
K3ALL 32.400- 300-54-B-27
W3AHZ 30.600- 255-48-A-17
W3HZN 28.373- 291-39-A-24
W3VXP 27.645- 170-65-A-25
K3CT5 26.125- 209-50-A-29
W3BHP 23.870- 175-56-A-24
W3ZC 23.513- 172-55-A-19
W3JPF 22.288- 207-45-A-20
W3EYV 20.396- 167-49-A-32
W3QKX 15.730- 143-44-A-16
W3MDE 14.500- 145-40-A-10
W3PKP 14.385- 137-42-A-20
W3HNE 14.256- 300-34-B-18
K3ACD 14.065- 198-29-A-21
W3JSA 14.000- 200-28-A-14
W3NCW 13.955- 114-47-A-20
K3HFW 11.503- 107-43-A-12
W3G8Y 11.300- 113-40-A-12
K3DZB 11.010- 154-20-A-25
K3ATL 11.000- 139-32-A-14
K3ANU 10.750- 100-43-A-7
K3PHX 10.605- 186-23-A-20
W3TWD 10.341- 104-12-A-12
W3HKN 78.65- 121-20-A-9
W3PNL 74.500- 100-30-A-13
W3ZON 74.000- 84-31-A-6
W3HUS 73.380- 60-32-B-5
W3HIO 36.661- 61-2-A-2
K3BKL 35.75- 65-22-A-13
W3GHD 35.665- 65-22-A-13
K3BPL 33.75- 50-27-A-8
W3NDJN 31.885- 53-25-A-3
W3NFE 30.000- 75-16-A-3
W3NFI 29.000- 68-17-A-6
W3DFJ 25.50- 51-20-A-8
K3AYY 24.15- 46-21-A-8
K3NDPQ 23.00- 45-22-A-14
W3CBH 21.25- 50-17-A-10
W3FKX 21.15- 47-18-A-12

W3JLL 1890- 42-15-A-6
W3QRT 1840- 18-14-A-9
K3BHX 1140- 29-16-A-6
W3DVB 1120- 28-16-A-3
K3BDLX 1015- 37-14-A-20
W3RNP 940- 27-16-A-39
W3U1U 368- 21-7-A-7
W3LWC 150- 10-6-A-2
W3RNP 45- 5-3-A-5
W3QMZ (K2JN W3QMZ) 91.798- 503-73-A-31
W3HIF (W3E HIF IKB) 67.083- 537-50-A-31
W3RPH (K2N ON OSY) 36.225- 230-63-A-21
K3NDUX (K3N DUX DUY) 2205- 49-21-A-37
W3AFQ (K2N DUX KFF SCU) 2100- 41-21-A-5
Md.-Del.-D. C.
W3EIS 217.266- 1192-73-A-40
W3GUA 204.583- 1129-73-A-40
W3KLA 184.051- 1010-73-A-39
W3TMZ/3 183.000- 1017-72-A-37
W3AEL 182.880- 1016-72-A-40
W3VAN 168.265- 1153-73-B-39
W3MSR 168.824- 1160-72-B-40
W3GRF 154.213- 845-73-A-36
W3HFE 153.483- 841-73-A-40
W3HFE 148.829- 816-73-A-40
K3CIO 141.346- 777-73-A-40
W3DRD 140.760- 782-72-A-40
W3MFP 138.244- 758-73-A-39
K3GRF 132.313- 725-73-A-37
W3HQU 99.618- 692-72-B-40
K3HJW 85.388- 506-69-A-40
K3CYA 76.630- 420-73-A-20
W3BRE 76.250- 500-61-A-32
W3KRA 75.075- 455-66-A-28
W3FRZ 58.500- 382-65-A-34
W3KZQ 57.600- 320-72-A-31
W3HYM 56.250- 375-60-A-25
W3U1E 56.000- 350-64-A-33
K3CWF 50.550- 339-60-A-40
W3WVG 46.538- 255-73-A-21
W8YKM/3 44.820- 332-54-A-25
W3ZQA 44.280- 416-54-B-31
W3ZQ 41.088- 323-64-B-20
K3BHD 38.360- 276-70-B-21
W3WMA 31.685- 258-54-A-26
W3PYZ 26.902- 223-61-B-20
K3ANA 19.805- 233-34-A-25
W3DCN 15.190- 202-30-A-27
W3HFE 14.550- 154-20-A-25
W3KDD 11.750- 100-47-A-17
W8GYL/3 8.680- 113-31-A-22
W3YAG 7.000- 70-40-A-26
W3QK 5.250- 75-35-B-12
W3FJD 3.088- 65-19-A-6
K3N3ST 2.820- 50-24-A-31
W3RNY 2.750- 45-25-A-6
W4WRF/3 2.043- 43-19-A-7
K3NDY 520- 16-13-A-4
W3LHE 388- 16-10-A-6
W3NTA 16- 3-3-B-1
W3MTU 3- 1-1-A-1
W3FYS (W3FYS, W6HOH) 184.185- 105-73-A-37
W3WV (W3WV, K6BUD) 157.289- 795-73-A-37
W3W8F (W3C PB W8F) 99.260- 545-73-A-36
W3GQF (7 ops) 99.006- 548-73-A-40

W3EAX (W3E JWN YVQ YYC) 58.515- 553-47-A-40
W3FQR/3 (W3E FQR GHX HQX) 20.504- 175-47-A-15
Southern New Jersey
W2HWD 157.413- 903-70-A-40
W28HM 151.230- 852-71-A-39
K2CPR 122.594- 680-73-A-34
K2OMT 120.450- 660-73-A-32
W2QDY 102.850- 605-68-A-37
W2EXB 99.400- 560-71-A-33
W2ILN 95.784- 591-65-A-28
K2UFE 79.670- 514-62-A-31
K2OOK 61.278- 522-47-A-29
W2DAJ 59.264- 463-64-B-29
W2SDH 45.454- 330-66-A-27
W2BUL 49.500- 300-66-A-22
K2BWH 40.279- 234-69-A-37
K2K2A 37.375- 300-50-A-24
K2MIO 33.150- 221-60-A-16
W2FXN 27.560- 210-53-A-6
W2RER 24.668- 215-46-A-23
W2APD 24.150- 210-46-A-23
K2KMH 23.188- 187-50-A-21
K2BGB 18.105- 142-51-A-12
W2BHV 16.700- 210-40-B-19
K2MPV 16.575- 170-39-A-21
K2ERC 12.505- 122-41-A-6
K2KJF 12.490- 104-48-A-9
K2MIO 12.355- 183-28-A-30
W2MFE 10.366- 142-51-A-12
W2THD 10.260- 114-36-A-16
K2PGH 9.025- 95-38-A-20
K2H2K 7.800- 90-39-A-12
W21AP 4.995- 111-18-A-6
K2AIM 2.875- 30-23-A-13
W2VQH 1.260- 16-18-A-11
W2VCN 1.120- 28-16-A-3
W2PAZ 1.060- 27-16-A-3
K2NJL 1.018- 7-11-A-6
K21TA 1.008- 31-13-A-1
W2ISZ 2.220- 12-8-A-2
W2PAU (W2E ENX PAU) 135.888- 783-70-A-39
Western New York
W288C 185.603- 1017-73-A-34
K2MVK 131.920- 782-68-A-30
W2FXA 127.620- 712-72-A-29
W2FEB 124.373- 712-69-A-40
W2MWM 112.880- 710-44-A-39
W2G8J 112.146- 617-73-A-38
K2EVP 108.985- 615-71-A-4
W2WOF 103.106- 636-65-A-35
K288X 75.375- 511-60-A-32
W21N 72.550- 495-65-A-30
W2EMW 70.810- 388-73-A-31
W2MTA 64.945- 419-62-A-23
K21ZJ 62.963- 395-69-A-33
W21CT 62.370- 449-36-A-40
K2JVV 51.548- 364-58-A-21
K2PKL 46.500- 304-62-A-31
W21CT 46.490- 392-56-A-20
K2IME 39.600- 362-44-A-35
K2DXX 35.845- 214-67-A-9
W2VJO 24.935- 274-51-A-23
K2VBT 20.356- 235-35-A-30
W2RHQ 20.390- 182-58-A-20
W2NZA 25.650- 285-45-B-15
K2PKK 24.200- 293-33-A-40
W21CT 24.301- 157-67-A-14
W2TFV 20.875- 168-50-A-16
W2ZFI 18.745- 147-51-A-15
W2KCT 18.625- 102-46-A-20
K2VPP 15.258- 182-34-A-33
K2BFF 15.139- 188-33-A-15

W2CJO 12.857- 139-37-A-15
K2DWR 12.730- 135-38-A-10
K2KCE 9.400- 100-47-B-3
W2QYU 8.776- 125-33-A-23
K2TDW 7.125- 76-38-A-16
W2OVP 5.100- 85-24-A-8
K2KRI 3.999- 71-23-A-19
W2FEF 2.750- 56-20-A-8
K2NEX* 2.236- 55-19-A-10
W2VBX 1.953- 38-22-A-38
K2RTZ 1.900- 48-16-A-8
K288B 1.573- 37-17-A-3
K2NRX 1.445- 37-17-A-18
K2PMP 1.040- 26-16-A-4
K2ZTC 3.653- 20-10-A-26
K2MTW 2.358- 35-19-A-10
K2MUC 1.05- 7-6-A-2
W2MUN (W2MUN, K2OVO) 32.489- 279-47-A-40
Western Pennsylvania
W3H7Q 142.355- 803-71-A-40
W3NRE 109.518- 617-71-A-35
W3YDK 95.134- 555-69-A-34
K3NKL 96.500- 380-70-A-33
W3TNQ 51.408- 378-68-B-32
W31GV 50.240- 314-64-A-22
W3KRY 41.038- 245-67-A-20
W3NUG 32.680- 304-43-A-26
W3MFE 30.198- 280-47-A-28
K3AFY 24.799- 197-51-A-26
K3BHD 19.875- 166-44-A-26
W3H7T 13.100- 132-40-A-13
K3CPP 5.250- 60-35-A-11
K3HDT 3.768- 70-22-A-6
K3HVV 3.590- 56-25-A-6
K3BZD 2.168- 37-17-A-8
K3CMC 2.024- 46-22-A-8
W3KQD 1.275- 30-17-A-2
K3NDJ 1.160- 29-16-A-16
K3CWB 860- 22-16-A-8

CENTRAL DIVISION

Illinois
W91RH 177.210- 988-72-A-39
W9ZAB 159.870- 876-73-A-36
W9NCP 158.153- 891-71-A-39
W9KLD 157.224- 863-73-A-40
W9NFI 151.940- 828-71-A-39
W9PZT 146.365- 802-73-A-40
W9C6F 132.810- 792-73-A-38
W9NFI 142.700- 506-71-A-27
W9JN 141.400- 811-70-A-35
W9LNO 139.065- 762-73-A-35
W9AMU 138.600- 770-72-A-37
W9NFI 137.160- 762-73-A-35
W9H2W 105.625- 635-67-A-37
W9MAD 105.210- 585-72-A-27
K9IND 92.700- 515-72-A-40
W9NFI 86.700- 506-71-A-27
W9ZDY 85.470- 519-66-A-31
W9ZRG 78.840- 133-73-A-25
W9NFI 78.975- 157-70-A-38
W9ARV 70.887- 520-68-B-30
W9PQC 67.320- 408-66-A-30
W9NFI 64.103- 396-69-A-40
W9NFI 60.000- 400-60-A-27
W9WIO 54.648- 396-69-B-17
K9IDW 54.079- 315-69-A-30
K9HMY 50.706- 332-61-A-23
W9ACM 50.000- 300-67-A-27
K9AWV 49.000- 356-56-A-26
K9KYR 47.175- 310-60-A-36
W9NFI 45.000- 300-67-A-27
K9ISF 40.500- 300-54-A-32
K9IYW 34.272- 252-68-B-32



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Says Michigan winner W8DUS, who has a KW-1 rock-crusher and 200 confirmed: "My ham career dates back to spark and although my business has been concerned with microphones and audio products, I am a card-carrying c.w. man." Incidentally, Al is W9IOP's boss.

K8NLVW... 893- 26-14-A 12
K8NLVW... 413- 19-10-A 10
W8VUV... 289- 11-11-A 6
K8NLGB... 160- 8-A-6
K8NLGK... 135- 10-6-A-2
W8UNE... 95- 10-4-A-6
K8LXI... 75- 6-5-A-6
W8TLT... 70- 7-4-A-1
W8PLQ... 45- 5-A-1
W8SDJ (W8 IFF SDJ) 166-258- 911-73-A-39
W8MAX (W8 OHN QW1, K8S DXW HKH IQQ) 86,460- 524-66-A-40
K8DVJ (K8S CTQ DVJ) 53,750- 500-43-A-40
K8JIX (K8S EHE JIX) 51,621- 540-61-A-34
K8WBL (4 ops.) 44,220- 264-66-A-25
K8CZJ/8 (W8TIN, K8CZJ) 37,700- 261-58-A-36
W8ODJ/8 (W8GKB, K8S H8V DFV) 19,580- 178-44-A-11

HUDSON DIVISION

Eastern New York
W2VCH... 111,873- 614-73-A-39
K2VHU... 80,900- 508-64-A-34
K2EUI... 63,830- 492-52-A-24
K2QIX... 59,378- 411-58-A-32
K2MBU... 50,513- 461-45-A-40
K2TII... 46,900- 312-60-A-29
W2BAC... 45,000- 300-60-A-20
K2HJX... 39,780- 307-52-A-34
W2TER... 35,640- 298-48-A-36
W2AZO... 34,296- 269-51-A-33
W2CJM... 27,848- 237-59-B-29
W2PKY... 26,031- 213-49-A-27
K2YAZ... 25,691- 203-51-A-20
K2YXB... 23,445- 263-56-A-17
K2MKC... 15,180- 255-24-A-8
W2NOY... 14,600- 100-73-B-17
W2RZK... 9373- 162-23-A-19
K2BIG... 9010- 107-34-A-15
K2KUA... 8700- 100-35-A-10
K2ZAU... 8040- 102-40-B-7
K2ZQHD... 8003- 100-33-A-40
K2GFX/2... 7468- 103-29-A-5
K2YFI... 6570- 73-37-A-5
W2AYM... 5938- 66-38-A-28
W2GRI... 4725- 70-28-A-11
K2YTK... 4263- 55-31-A-9

W2YAKK... 2770- 63-19-A-25
K2LZW... 2704- 54-21-A-19
K2IOV... 2673- 65-20-A-4
K2PRB... 2330- 44-23-A-4
K2OHG... 2256- 49-19-A-15
K2YTD... 1950- 52-15-A-6
W2KXN... 1378- 29-19-A-5
W2ATC... 1340- 41-16-A-10
K2NSJ... 1243- 32-14-A-25
W2WOB... 748- 23-13-A-2
W2BMC... 3- 1-1-A-1

N. Y. C. L. I.
W2AYI... 166,440- 912-73-A-37
W2PPE... 143,640- 798-72-A-40
K2IDGT... 142,625- 815-70-A-37
W2MZH... 132,300- 735-72-A-35
K2IAD... 131,400- 720-73-A-38
W2OWO... 123,586- 722-69-A-40
W2CWD... 123,090- 754-68-A-40
K2PRP... 111,860- 658-68-A-39
W2DUS... 100,595- 649-62-A-38
K2IYC... 94,180- 557-68-A-40
K2BTP... 83,160- 505-66-A-37
W2MDM... 73,932- 606-61-B-33
K2UQX... 73,080- 503-58-A-36
K2JRO... 70,150- 460-61-A-31
K2RAR... 69,694- 443-63-A-31
W2AEP... 68,407- 513-67-B-32
K2YGM... 63,075- 440-58-A-34
K2LTI... 56,875- 440-55-A-4
K2QHW... 56,719- 414-55-A-25
K2OPJ... 49,665- 301-66-A-12
W2MUM... 40,000- 250-64-A-8
K2FC... 39,139- 250-63-A-9
W2WUQ... 37,969- 330-45-A-26
W2ZVY... 37,875- 253-60-A-21
K2IUT... 37,605- 327-46-A-36
W2NYC... 37,034- 282-53-A-26
K2ROH... 33,565- 277-49-A-27
K2CMV... 31,750- 254-50-A-18
K2YMO... 30,400- 304-50-B-19
W2HJQ... 29,180- 272-43-A-11
K2TVP... 28,600- 209-55-A-14
W2GPP... 28,438- 325-35-A-19
K2LFP... 27,869- 234-49-A-8
K2LXI... 24,994- 233-43-A-9
W2DUN... 24,885- 238-42-A-38
W2OBU... 24,238- 272-35-A-14
W2AIZ... 23,000- 230-40-A-25
K2TOL... 21,675- 174-51-A-19
W2HII... 21,420- 180-48-A-30

W2ICO... 18,850- 130-58-A-15
K2HTX... 18,522- 189-49-B-26
W2YKQ... 15,400- 157-40-A-20
W2IRV... 15,050- 150-43-A-6
K2TBU... 14,520- 121-48-A-6
W2KGN... 14,210- 98-58-A-8
W2CTY... 13,650- 200-55-B-15
W2HTZ... 13,125- 210-25-A-15
W2DQN... 12,994- 110-45-A-11
W2IAL... 12,000- 120-40-A-10
W2DID... 11,970- 171-28-A-16
W2KVL... 11,288- 105-43-A-15
W2TNI... 10,625- 125-34-A-11
K2BHL... 10,300- 103-40-A-8
K2POB... 10,050- 102-40-A-16
K2PXX... 9019- 98-37-A-21
K2HGR... 8446- 120-29-A-15
W2JJC... 7280- 91-32-A-19
K2CJS... 6583- 70-37-A-17
K2VNS... 6150- 100-25-A-16
W2E80... 5754- 69-42-B-4
K2JLD... 5534- 117-19-A-10
K2PHF... 5502- 131-21-B-3
K2IDZ... 5460- 84-26-A-24
K2UMO... 5031- 81-25-A-10
K2NPE... 4615- 74-26-A-28
W2TUK... 4080- 68-24-A-3
K2MIG... 4000- 81-20-A-9
K2NIUV... 3249- 64-23-A-19
W2USN... 3116- 10-16-A-10
W2CUE... 2480- 62-16-A-9
K2NTZG... 2126- 50-21-A-25
K2JUN... 2020- 45-18-A-6
W2JCA... 1575- 30-21-A-4
W2BKC... 1200- 31-16-A-23
W2BHH... 1088- 29-15-A-6
K2UVC... 1023- 27-15-A-2
K2OFT... 938- 38-10-A-7
W2BQK... 915- 32-12-A-19
W2OBN... 748- 23-13-A-6
K2JUN... 712- 21-12-A-6
K2NJK... 618- 21-13-A-17
K2TTFB... 298- 17-7-A-7
K2N2OK... 193- 12-7-A-11
W2NMGV... 175- 7-4-A-1
K2PVX... 120- 8-6-A-1
K2LJW... 113- 8-6-A-6
W2QFF... 100- 9-4-A-1
K2MJJ... 96- 7-6-A-1
W2HBO... 90- 6-6-A-2
K2NOFD... 75- 8-4-A-7
K2N8C... 70- 5-A-4
W2APW... 63- 5-A-5
K2ZYR... 43- 3-B-6
K2NTEP... 4- 2-A-1
W2RLM (W2RML, K2RUL) 107,888- 694-63-A-40
W2ABC (W2AB, ABC AHM) 63,128- 467-57-A-34
K2AAW (K2S AW ZYB) 18,450- 164-45-A-16
K2VWZ (K2KQH, K2VWZ) 10- 2-2-A-1

Northern New Jersey
W2DMJ... 184,500- 1025-72-A-40
W2ZSM... 176,570- 1010-70-A-39
W2CQB... 155,164- 900-69-A-38
K2LGN... 141,620- 778-73-A-38
W2OIB... 149,625- 855-70-A-40
K2GAL... 118,649- 680-67-A-40
W2EZY... 113,150- 620-73-A-39
W2TPJ... 107,745- 653-66-A-31
K2YJH... 100,040- 659-61-A-35
W2ERC... 99,000- 600-66-A-36
K2GHW... 98,560- 704-70-B-40
K2MFP... 86,423- 603-69-A-30
W2GND... 84,498- 466-73-A-28
W2DRY... 83,896- 330-63-A-30
K2BHQ... 79,380- 504-63-A-25
W2WOS... 78,315- 434-69-A-31
W2KHT... 68,435- 422-65-A-30
K2AYC... 63,340- 408-67-A-33
W2LXN... 67,938- 507-67-B-25
W2CVC... 62,685- 400-63-A-22
K2PFI... 57,264- 376-61-A-29
W2BRC... 52,515- 389-54-A-28
K2ERM... 47,235- 411-47-A-35
W2OWX... 46,750- 374-50-A-25
W2HTN... 46,436- 305-61-A-17
W2TWC... 46,423- 300-72-A-14
W2EHN... 45,725- 313-59-A-26
W2EZW... 44,399- 273-65-A-30
K2QYL... 44,010- 329-54-A-17
W2HUG... 39,456- 289-59-A-20
W2SJB... 36,578- 277-54-A-24
K2IUT... 36,010- 212-57-A-27
K2QWT... 28,000- 200-56-A-24
W2BVE... 27,000- 227-48-A-6
W2ZEP... 26,565- 231-46-A-15
W2DEN... 20,405- 180-59-A-17

W2BWW... 25,350- 169-60-A-34
K2UBW... 24,550- 260-38-A-29
W2GWR... 21,700- 217-40-A-13
W2VMN... 20,000- 203-68-B-6
W2OPE... 18,866- 176-43-A-30
K2BJA... 18,600- 180-40-A-13
W2BZB... 16,720- 160-43-A-10
K2HRS... 15,560- 192-32-A-19
W2SNV/2... 12,900- 135-40-A-18
W2IBZ... 12,788- 166-31-A-11
W2TJD... 12,240- 136-45-B-9
K2PIM... 12,160- 128-38-A-9
K2PGH... 11,715- 147-33-A-11
W2LTL... 11,550- 200-24-A-24
W2WW... 11,408- 117-39-A-9
W2PRE... 10,658- 73-73-B-22
W2ZVW... 9975- 105-38-A-7
W2ACN... 9400- 72-7-B-5
W2RWM... 9240- 112-33-A-9
K2VVL... 8619- 111-39-B-12
K2DSW... 8578- 73-47-A-5
K2TUN... 8505- 81-16-A-10
K2ZHK... 8443- 154-22-A-14
W2BDV... 7219- 85-35-A-33
W2UCA... 7088- 105-27-A-19
W2GFW... 6698- 100-34-B-5
W2BOL... 6030- 102-24-A-15
W2CFC... 5735- 74-31-A-11
W2BIB... 5320- 76-28-A-5
W2SLN... 5160- 80-28-B-6
W2PY... 3740- 68-22-A-10
W2JIB... 3563- 75-19-A-7
K2JUN... 3020- 45-18-A-6
K2ZSN... 2800- 56-20-A-20
W2BLK... 2678- 53-21-A-10
K2NMBX... 2231- 44-21-A-16
W2DID... 2126- 50-21-A-25
W2COC... 1480- 37-10-A-23
W2ILF... 1225- 35-14-A-9
K2RXN... 1120- 33-14-A-5
K2NOCY... 720- 1-8-A-4
K2VAB... 682- 31-1-B-2
K2N8BW... 440- 17-11-A-6
K2N8K... 288- 12-10-A-6
W2N8V... 254- 19-7-A-22
W2LRO (W2LRO SJU) 53,575- 350-61-A-24
K2CQY (K2C QVY CQY) 22,570- 257-37-A-31
K2NOX (2 ops.) 480- 22-12-A-26

MIDWEST DIVISION

Iowa
W0VXO... 191,430- 1088-72-A-40
W0FEZ... 149,285- 818-73-A-39
W0CCN... 141,985- 778-73-A-37
K0GXR... 116,756- 863-68-B-40
W0EQN... 96,061- 594-67-A-31
K0AZJ... 92,408- 547-66-A-34
K0BIB... 87,630- 518-49-A-39
W0GQX... 79,530- 482-66-A-25
W0BRS... 59,940- 333-72-A-31
K0HLL... 59,730- 277-58-A-34
K0ZWL... 57,760- 266-56-A-30
K0AUI... 34,200- 300-57-B-26
K0PFI/0... 28,669- 212-53-A-40
W0U8P... 27,868- 199-56-A-22
W0TLL... 27,710- 218-52-A-28
K0BLJ... 22,464- 210-54-B-16
W0ATA... 21,420- 154-56-A-10
W08NL... 20,825- 197-70-A-25
K0JDV... 20,160- 175-48-A-24
K0JRT... 19,900- 181-45-A-29
K0OVR... 15,803- 158-43-A-36
W9WJD/0... 14,700- 120-49-A-19
W0D8P... 7600- 80-38-A-5
K0AYZ... 5495- 79-28-A-12
K0PCG... 5483- 87-26-A-6
K0DPJ... 1995- 51-19-A-7
K0NPV/3... 1306- 28-19-A-21
K0N9AK... 1295- 25-A-16
K0LFA (K0B DPH LFA) 97,650- 550-72-A-35
K0CLS (W0PKH, K0S APS CLS DIA) 76,032- 576-66-B-40
W0LNI (W0D8P, K0MTM) 50,875- 323-63-A-28
K0LEZ (W0S SMS ZAQ, K0S EUV IEZ) 5550- 96-40-A-14
W0YSE (2 ops.) 20,800- 200-52-B-1-
K0B8K (K0B H8K GTF, K0MTL) 1435- 73-36-A-17



Meanwhile-Back-at-the-Ranch idea courtesy Lower Yakima Valley Radio Amateurs.

W9IRH got a Novice ticket in '54, rose to earn his SS spurs by clobbering 124 Illinois brasspounders in '58. Johnny eyes 200K hungrily, is serving a short Army hitch now but returns to mufi in July, "just in time to ready the station for the '59 SS." A CQ-SS wheel is in the offing.

K0GTF (K0s BSK GTF, KN6MTL)

2903- 43-27-A-14
KN0QAI (2 ops.)
2145- 40-22-A-24

Kansas

K0HJR 143,464 865-67-A-40
W0QW 122,850 709-70-A-34
W0QWA 117,150 660-71-A-40
K0ITF 116,784 815-72-A-40
W0BYV 56,608 464-61-B-32
K0HLC 32,700 218-60-A-19
K0LWK 24,700 190-52-A-39
K0KXZ 19,375 185-42-A-26
K0GZP 15,125 122-50-A-14
W0JFG 9,506 99-39-A-20
W0CFH 8,200 83-40-A-12
W0TTO 4,566 69-34-B-8
W0CHJ 4,016 60-27-A-5
W0SPF 2,010 34-24-A-8
KN0PFV 2,010 34-24-A-8
W0QOQ (W0IPV, K0s HGJ JHC JRO)
33,626 280-19-A-36

Massachusetts

W0TDR 142,898 783-73-A-40
K0GJD 96,030 582-66-A-40
K0JPL 79,200 498-66-A-37
W0QW 73,225 417-68-A-40
K0HIM 68,000 427-64-A-34
W0MNC 54,405 351-62-A-32
K0KWK 48,405 325-61-A-32
W0ETV 43,039 250-69-A-18
W0FIN 43,120 306-56-A-28
W0ARO 38,800 288-54-A-34
K0KQ 28,755 225-52-A-33
K0LGZ 24,840 216-46-A-18
KN0PFF 7,354 80-37-A-16
KN0REV 6,800 87-44-A-27
K0HOK 4,226 81-18-A-7
W0KIK 1,900 41-19-A-16
W0JTC 1,425 29-10-A-7
K0HUV 1,225 25-14-A-7
K0AXU (7 ops.)
57,184 332-69-A-39
W0EEA (6 ops.)
43,000 387-56-B-20
K0CQA (K0s CPN CQA)
27,650 200-56-A-16

Nebraska

W0NYU 131,488 785-67-A-40
W0WLO 114,576 651-71-A-40
W0TBR 108,268 700-62-A-38
K0MRS 63,975 439-60-A-32
W0W 33,969 231-38-A-33
K0LOK 5,880 76-32-A-13
K0BQM 413 16-11-A-5
K0BFB (W0ASQ, K00BR)
62,344 509-62-B-36

NEW ENGLAND DIVISION

Connecticut

W0FEA 180,000 1007-72-A-39
W0BIB 179,945 990-73-A-40
W0TYQ 172,441 978-71-A-40
W0W6 171,110 1205-71-B-40
W0RAN 142,568 1007-71-B-40
W0MHE 126,000 700-72-A-34
W0LYQ 122,500 705-70-A-36
W0EHC 113,710 667-68-A-38
W0LKE 111,720 798-70-B-38
K0DHC 108,875 670-65-A-38
W0ZDF 107,920 608-7-A-38
W0TUT 104,198 638-66-A-38
W0TUT 90,000 500-72-A-39
K0CFA 78,461 315-61-A-28
W0VIG 71,613 491-78-B-27
W0MBS 65,395 481-78-B-27
W0HIF 56,115 387-58-A-28
K0AJJ 55,080 460-48-A-38
K0ACC 50,460 348-58-A-38
W0TIX 46,434 327-71-B-17
W0TIF 37,570 221-68-A-17
W0WMB 35,550 316-25-A-25
W0CHR 32,630 252-52-A-15
W0NJM 25,300 230-44-A-11
W0ADW 24,300 203-63-A-14
W0EWF 22,945 177-52-A-13
W0JZZ 16,370 126-52-A-10
W0JTD 15,844 105-65-A-4
K0CBI 14,022 116-49-A-21
KN0HTV 13,018 132-41-A-20
KN0GCS 11,495 105-44-A-20
W0YMY 4,610 74-26-A-3
KN0GJR 4,068 68-31-A-21
W0REF 4,675 110-17-A-3
K0GUD 3,623 63-23-A-29
W0UYV 3,420 48-29-A-11
W0NLM 3,344 44-38-B-8
KN0EVB 2,915 53-22-A-11

W0ASO 2,550 68-15-A-9
KN0GIP 2,520 52-21-A-18
W0OPB 880 22-16-A-7
K0ILJ 810 27-12-A-6
W0AMY 750 30-10-A-1
KN0HOP 263 16-7-A-8

Maine

W0DEO 71,175 380-73-A-30
W0YIS 69,595 452-62-A-30
K0GOG 26,048 229-46-A-39
W0LNC 14,985 166-37-A-18
K0BAZ 13,213 153-35-A-30
K0AHS 1,880 47-20-B-10

Eastern Massachusetts

K0CQO 149,455 842-71-A-40
W0LNC 140,890 772-73-A-40
W0OPB 113,500 660-70-A-40
W0TBC 10,139 605-73-A-33
W0MGO 109,260 607-72-A-30
W0JSM 100,101 575-73-A-30
W0MIX 78,750 500-63-A-36
W0EIQ 73,310 443-68-A-32
W0COL 74,728 421-71-A-38
W0NS 52,853 325-66-A-26
K0CUD 46,894 309-61-A-33
W0LJO 42,333 287-59-A-28
W0LNC 41,738 316-53-A-22
W0MKG 39,300 385-50-B-30
K0CLO 37,730 311-49-A-23
W0PSS 36,465 215-68-A-33
W0MGO 34,830 338-54-A-13
W0PLJ 31,493 221-57-A-26
W0ONP 30,148 195-62-A-22
K0BYL 27,465 379-29-A-24
W0LNC 27,465 379-29-A-24
W0HY 19,440 162-48-A-17
W0CWL 17,380 149-47-A-21
W0MGO 17,070 157-44-A-13
W0NGT 12,208 130-36-A-22
K0BDR 9,215 105-38-A-26
W0QFO 6,660 112-24-A-18
W0MGO 4,905 58-31-A-4
W0MCM 3,915 87-18-A-21
W0LGO 2,850 57-20-A-7
W0MGO 1,600 40-16-A-4
W0MGO 1,205 37-13-A-4
W0ETH 1,080 24-18-A-2
W0EIF 615 21-12-A-5
W0MGO 22-10-A-5
W0IOP 155 14-13-A-5
K0IDE 166 10-7-A-1
K0ACQ 114 8-7-A-2
KN0HD 5 5-A-3
K0ICE 45 5-A-3
W0MGO (6 ops.)
106,760 785-68-B-35
W0WAI (W0L DDF WAI)
97,155 762-64-A-29
W0IAF (K0s DLJ HGM, W0SHF)
35,100 330-54-B-22
W0LMS (W0L JMS KFF, K0s BID HIE)
10,902 122-46-B-25
K0KIR/I (W0IAJ, K0KIR)
5495 79-28-A-7

Northwestern Division



Rhode Island

W0ICH 126,913 718-71-A-39
W0IRM 117,250 700-67-A-40
K0CBB 61,045 421-58-A-40
W0IRF 56,883 376-61-A-38
W0LWA 47,453 333-57-A-19
W0WIG 44,888 266-63-A-19
K0IPI 43,313 275-63-A-37
W0IPI 39,345 325-61-B-30
K0BDR 11,224 110-41-A-27
W0LQJ 9,680 163-24-A-19
K0KDF 8,980 76-31-A-6
W0CMH 5,858 71-33-A-2
W0TNC (K02YJ, K0ARP)
K0AON 75,640 610-62-B-1
W0SKT (W0WIG, K0EIJ)
W0QGG 69,818 487-58-A-40

Vermont

W0QMM 91,170 507-72-A-34
K0ICF 65,839 450-59-A-40
K0HVN 11,58 125-375-62-A-30
W0SWH 120,425 190-43-A-30
KN0HCO/I 536 20-11-A-22
K0KGG/I (KN0HCO, K0KGG)
7670 111-28-A-22

NORTHWESTERN DIVISION

W0LKE 55,725 381-60-A-39
K0LTC 18,105 142-51-A-4
K0LTFH 5328 73-37-B-6
K0LCTB (K0LTS CND CTB)
7254 93-39-B-1

Alaska

W0WMO 51,699 354-59-A-31
K0CPC 10,660 115-61-A-23

Idaho

W0WHA 116,424 825-72-B-40
W0WGL 84,756 401-65-A-31
K0TAB 62,278 440-58-A-36
W0TPE 59,710 430-56-A-29
K0OUK 7 6,525 89-30-A-1

Montana

W0WYT 142,375 861-68-A-40
W0LAL 122,751 705-68-A-30
W0WFC 93,600 750-66-A-39
W0TJA 79,730 469-68-A-40
W0KMU 64,080 405-64-A-34
K0ZAH 51,170 303-68-A-32
W0LTL 30,800 224-65-A-27
W0TFL 15,921 139-47-A-20
K0BKB 12,758 122-41-A-16
K0BBD 11,020 116-38-A-10
K0TCBN 5,900 37-8-A-17
W0DMC (9 ops.)
26,500 213-53-A-33

Oregon

W0WYT 142,375 861-68-A-40
W0LAL 122,751 705-68-A-30
W0WFC 93,600 750-66-A-39
W0TJA 79,730 469-68-A-40
W0KMU 64,080 405-64-A-34
K0ZAH 51,170 303-68-A-32
W0LTL 30,800 224-65-A-27
W0TFL 15,921 139-47-A-20
K0BKB 12,758 122-41-A-16
K0BBD 11,020 116-38-A-10
K0TCBN 5,900 37-8-A-17
W0DMC (9 ops.)
26,500 213-53-A-33

Washington

W0WYN 167,353 933-73-A-40
W0WMO 160,020 889-72-A-40
W0LPE 150,938 884-70-A-40
W0TQE 129,939 714-73-A-40
W0TAS 119,510 705-68-A-30
W0TGL 82,324 600-69-B-34
W0TJC 73,308 431-71-A-40
K0TCH 73,185 437-68-A-39
W0TRO 70,702 431-66-A-19
W0AVY 58,240 366-64-A-36

K0AST 50,763 333-62-A-36
W0QLH 44,606 295-61-A-34
W0DPW 33,894 248-55-A-21
W0DZX 21,420 153-56-A-36
W0BJR 18,900 135-66-A-14
W0TTO 14,040 117-48-A-13
W0TZE 10,000 100-46-A-9
K0BRQ 7770 111-28-A-1
W0MFA 7090 70-40-A-9
KN0CEO 6316 90-31-A-30
K0NAT 3715 64-36-A-5
W0TNP 5500 100-22-A-14
K0TGV 3673 59-26-A-37
K0NAT 3600 55-21-A-24
W0TUE 2970 44-27-A-24
K0ZAD 2138 50-18-A-8
KN0GDO 1348 49-11-A-25
W0TWN 454 17-11-A-6
W0TJD 259 12-3-A-1
K0TBR 30 4-3-A-1

PACIFIC DIVISION

Hawaii

K0HGL 104,609 717-73-B-39
K0HHA 73,613 459-65-A-39
K0HGC 34,510 244-58-A-30
K0GCV 20,882 197-53-B-23

Nevada

W0KEV 188,083 1071-71-A-40
W0ZVN 36,018 317-58-B-32
W0WU 16,416 152-54-B-12

Santa Clara Valley

W0TTL 156,786 859-73-A-35
W0MPQ 153,183 863-71-A-36
K0UCP 122,741 698-71-A-40
W0XLI 85,425 510-67-A-23
K0AYB 38,055 258-59-A-22
W0CLZ 34,840 288-52-A-29
K0CUD 34,375 250-55-A-27
W0BCT 27,500 200-55-A-39
W0HOC 10,258 73-73-B-13
K0BLU 7933 90-38-A-32
W0EGX 5313 125-17-A-15
K0LQY 2870 85-14-A-7
W0MMG 2750 55-10-A-7
K0KPB 1365 30-21-A-11
KN0GWQ 290 18-8-A-6

East Bay

W0TTL 167,760 932-72-A-40
K0HCH 150,840 847-70-A-40
K0GCS 112,146 665-73-A-35
K0GCV 85,200 481-71-A-35
W0GEB 76,763 445-69-A-28
W0EPI 66,526 504-66-B-29
W0SBL 62,885 400-63-A-39
K0PXY 55,875 375-60-A-35
K0CUD 50,715 323-63-A-40
K0TWT 44,250 300-50-A-36
W0YLL 13,395 141-38-A-22
W0BHR 350 24-7-A-11

San Francisco

K0OPT 126,000 702-72-A-38
W0SBL 118,825 678-70-A-40
W0EYV 115,908 662-71-A-27
W0SVC 72,504 507-72-B-35
K0EYV 17,200 172-40-A-31
W0WLV 10,878 87-42-A-19
K0EKC 2,194 43-29-B-4

(Continued on page 176)



Y L NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

DXCC YLs

The following list contains the call letters of YLs who hold the Postwar DX Century Club award as of March 15, 1959. The number and date following the call letters is the number of the certificate and the date it was issued.

Phone	
W1MCW . . . 18	4-21-48
W2PBI . . . 115	8- 4-49
W8BFQ . . . 222	4- 6-50
LU4MG . . . 290	9- 1-50
EA2CQ . . . 363	4-25-51
LU4DMG . . . 504	6-24-53
CO2BK . . . 547	1-16-54
IT1AFS . . . 560	3-25-54
W2FZO . . . 604	1-31-55
KZ5DG . . . 637	5-16-55
W9QLH . . . 662	7-19-55
DI6VM . . . 724	3- 2-56
W6QOG . . . 737	5- 1-56
EA7EV . . . 770	7-12-56
W1VFK . . . 772	7-16-56
PY7BVG . . . 797	9-18-56
ZP5ET . . . 810	9-26-56
K5BEU . . . 849	12-26-56
W1RYJ . . . 861	1-25-57
W6CXC . . . 897	4- 3-57
ZP5JP . . . 930	5-29-57
W5JCY . . . 960	7-12-57
W3BIW . . . 985	8- 2-57
I1ZFF . . . 994	8-12-57
ZE1JE . . . 1011	9-18-57
I1SGZ . . . 1018	10- 1-57
W5HWK . . . 1059	11-18-57
KL7ALZ . . . 1080	12-19-57
W4VCB/3 . . . 1113	1-25-58
K8ACC . . . 1119	2- 5-58
W5HWX . . . 1171	3-27-58
K4CYF . . . 1188	4-10-58
W3GEN . . . 1224	5-19-58
W7TGG . . . 1283	8- 4-58
KL7BHE . . . 1306	9-15-58
PY5QZ . . . 1329	10- 1-58
W3ICQ . . . 1338	10-13-58
K2MGE . . . 1361	11- 5-58

PHONE and C.W.

W6YZU . . . 311	11-19-48	K5AHZ . . . 2805	2- 1-57
W2NFR . . . 393	2-23-49	W9MPX . . . 2819	3-11-57
W6UHA . . . 399	3- 4-49	W1YYR . . . 2850	3-28-57
W4TR . . . 472	4-29-49	K5ADQ . . . 2874	4- 9-57
G3ACC . . . 750	10-28-49	Z8IRM . . . 2988	6-17-57
W1FTJ . . . 829	6-27-50	W3GEN . . . 3031	7-28-57
Z86KK . . . 870	3-18-50	W9OMZ . . . 3048	8- 5-57
W9TMU . . . 998	7-28-50	W4VCB/3 . . . 3058	8-12-57
Z82EC . . . 1269	6- 8-51	K60WQ . . . 3061	8-13-57
VK3YL . . . 1407	12-26-51	W8OKB . . . 3111	9- 9-57
W5UCQ . . . 1880	1-26-54	DJ2YL . . . 3119	9-18-57
W9QLH . . . 2004	8-30-54	VE3DKY . . . 3253	12- 2-57
W1RYJ . . . 2024	10-14-54	W5DRI . . . 3476	4- 7-58
F3YP . . . 2041	11- 1-54	W1RLQ . . . 3504	4-24-58
KZ5DG . . . 2138	5-16-55	W5EGD . . . 3515	5- 1-58
W3WUH . . . 2171	7-15-55	KL7BHE . . . 3516	5- 2-58
Z86WJ . . . 2204	8-24-55	W38KQ . . . 3733	8-18-58
KZ5KA . . . 2347	3-12-56	KH6AUJ . . . 3756	8-25-58
W7QGF . . . 2388	4-16-56	K0BFS . . . 3812	9-20-58
K6ENL . . . 2451	6-20-56	PY4OD . . . 4022	1- 9-59
W1VFK . . . 2630	10-15-56	W9MLE . . . 4029	1-14-59
W1YYM . . . 2651	11- 1-56	K5BEU . . . 4113	2-24-59
W6CXC . . . 2700	4-29-56		

Coming YL Get-Togethers

Oregon ARA State Convention — YL Program

May 2 and 3, Roseburg, Oregon. Activities for YLs, include a special breakfast and luncheon, fashion show, greenhouse tour, and earring contest. Contact Charlene McLean, K7DIV, for further details.

Women Radio Operators of New England

May 2, Pillar House, Newton, Mass., on Route 128 near Route 9. All W1 YLs cordially invited to attend annual Spring luncheon of WRONE. Contact Onie Woodward, W1ZEN.

* YL Editor, QST: Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.



Santa Barbara YL Get-Together

May 23, Hotel Carillo, Santa Barbara, California, for W6 YLs. Contact Gladys Eastman, W6DXI.

Eleventh ARRL National Convention — YL Program

June 19-21, Galveston, Texas. Program for licensed YLs will be hosted by members of GAYLARK, with Pres. Lillian Beebe, W5EGD, serving as chairman. High lights include a special breakfast with YLRL forum, a YL display booth, and hospitality room. The booth will display various YL certificates, QSLs, and YL handcraft. A ham station will be manned by W5 YLs for handling convention traffic. K5s ALF, BJU, and BWM, are chairmen of the aforementioned activities.

ARRL New England Division Convention — YL Program

Sept. 5 and 6, Hartford, Connecticut at the Statler Hotel. YLs from the six New England states won't want to miss this one. Convention attendance will be limited so reserve Labor Day week end right now and watch for further details.

Homework Anyone?

1. Name three basic parts or sections usually included in an antenna system.
2. What determines the polarization of a straight wire antenna?
3. True or False — In general, antenna construction and location become more critical and important on the higher frequencies.
4. What is meant by the bandwidth of an antenna?
5. Describe a simple dipole antenna.
6. Define front-to-back ratio.

Have to check on some of the answers? Chapter 14 on Antennas in any edition of the ARRL Handbook for the past few years is the reference we used. Let's compare notes next month.

If you like the idea of a smattering of technical talk here, let us know. Sure, and the rest of the magazine is ours for the learning too, but perhaps a bit of exposure to things technical on our own page (with deep deference to that small but inspiring group of YL operators who can and do hold their own in technical matters) will spur us on to a more extensive enjoyment of radio.

KEEPING UP WITH THE GIRLS

CLUBS:

Georgia Peaches—Twenty-six members are happy to QSO with anyone interested in the Georgia Peach Certificate, which is offered upon contact with 10 Peaches. Send QSLs to Peggy Butterfield, K4KKR, 2203 Terry Mill Rd., Atlanta, Ga.

Camellia Capital Chirps—Doing their parts to publicize the California Camellia Festival March 6-15, members issued special camellia certificates to the first 3500 hams contacted during the annual festival.

SPARCYLs are flying a new YLRL affiliation certificate (at least 50% of the membership belongs to YLRL). The club's foreign "adoptee" ZS2NW, Estelle, sent over a big box of gifts, African style, as a token of friendship.

Los Angeles YLRC—Some 100 YLs brought their OM's to the annual club YL-OM banquet. Mr. Bernard Linden, FCC Engineer-in-charge of the Los Angeles office and OM W6MLZ were guest speakers. Travelers W9RUJ, Marv, and W9YWH, Evelyn, were present. W6MFP, Agnes, made ceramic hearts for each YL, with name and call inscribed.

WAYLARC's had a Valentine YL-OM dinner too, with twenty-two in attendance. W3RXJ, Irene, and W6QYL, Martha, planned the pleasant party, with the guests providing the spontaneous entertainment when each was asked to deliver a one minute speech (with mike) on her most interesting QSO or her pet peeve of ham radio.

Miscellany

YLs involved with handling traffic in an attempt to locate a missing boy from Atlanta were K4s CYV, DNL, IFF, KKR, KZT, LVE, MEH, and RNS. . . . W0ERR reports that she is active along with K0ERR, GZI, LSL, SDK, and W0QIW in the Denver area on 50 Mc. Ann is a member of the Mile High Hi Bander six meter net. . . . W1YPH, Leona, happily announces that her son and wife are new novices. Her daughter-in-law Jean is KN1JJV in Springfield, Mass. . . . Look for Vermont YL W1ZWV, Arline, on 15 meters. . . . The Acara YL Net of Wichita, Kansas has changed net frequencies from 7.280 Mc to 145.35 Mc, according to KN8SML, Irene. . . . Another YL to take up flying is W1SVN, Millie, mother of four young boys, anticipates operating airborne occasionally. . . . OQ5IE can be found on 20 a.s.b. nearly every afternoon, and ZE1JE tunes up on 7066 kc. in the early evening. Both Jane and Molly look especially for YLs. . . . W1FEY is off the air due to a fire at her QTH which put her in the hospital with first, second, and third degree burns. Happily, Skip is progressing satisfactorily. . . . W1BBS, Kate, of Freeport, Maine, is manager of the Northeast area Barnyard Net.

Lucia Tome, CR7LU, sends word of an International DX Contest sponsored by the DX Hunter's Club of Beira, Mozambique, Portuguese East Africa. The contest will run between August 15 and 25 and "any fixed station in the world, amateur bands, c.w. or phone, can compete under terms of their licenses in their respective countries." W amateur participation is cordially invited. Lucia writes that her official DXCC score has increased to 151, with 12 more QSLs expected. She and her OM CR7DQ attempted operations on 50 Mcs. but regrettably found that they could work only local CR7IT. They have returned to daily operation on 7, 14, 21, and 28 Mc.

Addendum to CQ YL

Bringing her book *CQ YL* up-to-date, author Louisa Sando, W5RZJ, announces that a page of addenda is now available to all who have already purchased copies of the book. Easily inserted in the spiral-bound, flexible book is a page of information listing 1959 YLRL officers, new awards available from the YLRL, additional holders of DX and v.h.f. awards, in addition to other award information. The page is available upon request to W5RZJ, 212 Sombrio Drive, Santa Fe, New Mexico (include return postage) and is the first of similar addenda to be printed annually in order to keep the book as current as possible.

Celebrating the first anniversary of publication, the price of *CQ YL* has been lowered to \$3.00 per copy. The book is the first complete history of the YLs of amateur radio. Containing 18 chapters and some 500 photographs, the author has covered every phase of YL activity in our hobby.

W7DAT Shower

Wondering if they may have initiated something unique, a group of Oregon YLs gave an on-the-air baby shower for Sandra Shepherd, W7DAT, XYL of W7GPC of The Dalles, Oregon. Organized by Marianna Kearney, W7WFO, with the aid of Ione Jorgensen, W7ZLS, the pink and blue baby shower net met on January 31st at 2:00 p.m. on 3890 kc. NCS Bea Austin, W7HHH, checked in W7s CSQ, GLK, GWG, HGS, ZLS, ZLT, and K7s AJB and DMH for vicarious attendance at the party.



Guest of honor W7DAT sends her thank-you-notes immediately on 75.

The expectant mother was lured to the hamshack of Hazel, W7JDU, after considerable intrigue. Pink and blue bows adorning the transmitter and receiver gave the clue to a novel approach to an old custom. Deluged by gifts that had been mailed in from YLs throughout the state, Sandra regained her composure enough to enjoy the roundtable that followed.

Naturally enough, when baby Scott arrived on Feb. 20, his parents confirmed his arrival to ham friends via QSL card announcements.

The party for W7DAT is the second "air-waves shower" that has been arranged by the Oregon YLs. The first was organized by W7DIC in honor of W7ENU a year ago.



Isn't the little fella cute? His mom and pop are Mr. and Mrs. Kazutake Hisajima of Yahata, Japan—by call, JA6MO and JA6PR. Mrs. Hisajima (Nariko) now has the company of several new JA YL operators as a result of a course conducted in Tokyo by several well-known JA OM's. The new YL calls are JA1s CIG, CLH, CU, CLJ, CLK, CLL, CLM. (Photo via W7DJU and W9BRD and info via JA1JH and K6DV)



To add to the "Wow" you just uttered and merely by way of identifying the operators on the left, and not the equipment, Ruth, W4BWR, and Bernie, W4ZBA, Nissen are a well-known mother and son team in Melbourne, Florida. Bernie does most of the rig building while Mom does the operating and painting. Ruth has served faithfully for several years as EC for South Brevard County. (Photo courtesy W4IYT and Florida Skip)



The newest in telephone facilities was demonstrated to members of the Los Angeles YLRC during a tour of the Pacific Telephone Company's largest Los Angeles office. A group of fifty enjoyed the tour, which was arranged by Lee Eastman, W6AWI, OM of club member W6DXI, and a Pacific Telephone Co. engineer. W6AWI advises that telephone companies throughout the country are usually happy to conduct demonstration tours for civic and technical groups. The photo shows W6AWI pointing out new equipment to YLs W6JZA (seated) and (left to right) K6OQD, K6BUS, W6DXI, W6MWU, W6CEE, K6PFY, and WV6BNS.



Celebrating, as the sign reads, their first anniversary, the Florida girls posed for this milestone photo at the Orlando Hamfest. Identifying all from left to right, back row first: KN4SMW, KN4UIZ, W4UF, K4RGR, K4QOS, W4PIK, W4KOH, K4LEG, and W4BIL. Middle row: W4BWR, guest, prospective YL, K4RED, K4BQI, W4ZVW, and W3CUL. Mae, guest speaker. Front row: W4HRC, W4KZT, K4IDQ, K4PPX, K4RNS, K4OJD, and a little friend. (Photo courtesy W4IYT and Florida Skip)

Strays

Phonetic confusion. A 3-way QSO on 40-meter phone between W8MM, W9MM and W9NN.

.....

A typographical misprint, we think. A recent club bulletin described plans for Fiend Day.

.....

The FCC is in need of Radio Engineers at

various points throughout the United States and possessions. Beginning salaries are \$4490 or \$5430, depending upon experience and student marks. For complete particulars, write to the Board of U. S. Civil Service Examiners, Federal Communications Commission, Washington 25, D. C., and request announcement No. 187B.

Armed Forces Day

16 May 1959

AMATEUR radio operators are invited by the Army, Navy, and Air Force to participate in Armed Forces Day communication exercises on Saturday, 16 May, 1959. The co-sponsors of the activities are the Director, Naval Communications, and Military Affiliate Radio System (MARS) representing the Army Signal Corps and the Air Force Director of Communications and Electronics.

Complete details are as follows: A c.w. receiving competition will feature a message from the Secretary of Defense. Any individual is eligible to participate. A certificate of merit will be issued to each participant who makes a perfect copy. Transmissions will be at twenty-five w.p.m. on the following schedules:

Time	Call Sign	Frequencies (kc.)
16 May 1959		
170300Z	WAR/AIR Army & Air	3347, 14,405,
(2200 EST)	Force radio, Wash., D. C.	20,994
170300Z	NSS (Navy radio,	3319, 4010,
(2200 EST)	Washington, D. C.)	6970, 14,480
170300Z	AGUSA (Army radio,	6997.5
(1900 PST)	San Francisco, Cal.)	
	NPD (Navy radio,	3319, 7595,
	San Francisco, Cal.)	14,927.5
	NPD (Navy radio,	7455
	Seattle, Wash.)	
	AG6AIR (Hamilton AFB	7832.5
	California)	
1100 GCT	NDT (Navy radio,	2287.5, 4545,
(2000 India)	Kami Seya)	9427.5, 13,471.5,
		16,445, 23,010

Each transmission will commence with a five-minute CQ. It is not necessary to copy more than one station, and no extra credit will be given for so doing.

Transcriptions should be submitted "as received." No attempt should be made to correct possible transmission errors. Time, frequency, and call sign of the station copied shall be indicated as well as the name, call sign (if any) and address of the individual submitting the copy.

A radioteletypewriter (RTTY) receiving competition will feature a special message from the Secretary of Defense. A certificate of merit will be issued to each participant who makes a perfect copy. Transmission will be at sixty w.p.m. on the following schedule:

Time	Call Sign	Frequencies (kc.)
16 May 1959		
170330Z	WAR (Washington, D. C.)	3347, 14,405,
(2230 EST)	NSS (Washington, D. C.)	20,994, 3319,
		7375, 14,480
	AIR (Washington, D. C.)	7915
170330Z	A5USA (Ft. Sam Houston	5302.5
(2130 CST)	Texas)	
	NDS (Great Lakes, Ill.)	7455
170330Z	AG6AIR (Hamilton AFB, Cal.)	7832.5
(1930 PST)	AGUSA (Army radio, San	6997.5
	Francisco, Cal.)	
170345Z	NDF (New Orleans, La.)	6970
(2145 CST)	NDW (San Francisco, Cal.)	3319, 7375
	NPD (Seattle, Wash.)	7455

Each transmission will commence with a period of ten minutes of test and station identification to permit amateurs to adjust their equipment. At the end of the test period, the message will be transmitted. It is not necessary to copy more than one station, and no extra credit will be given for so doing. The message should be submitted as received. No attempt should be made to correct possible transmission errors. Time, frequency, and call sign of the station copied should be indicated as well as the name, call sign and address of the amateur concerned.

Messages copied in the contest should be submitted to: Armed Forces Day Contest, Room BE1000, The Pentagon, Washington 25, D. C.

The high light of the Armed Forces Day amateur radio activities will consist of military-to-amateur transmitting and receiving contacts, for all holders of valid U. S. amateur radio licenses. Headquarters stations of the Army, Navy, and Air Force in Washington, D. C., will establish radio contact with amateur stations and will acknowledge these contacts with a new type varicolored QSL card. Contact may be made with the Headquarters station of each of the three services providing an opportunity to qualify for the three different QSL cards.

Military stations, WAR, NSS, and AIR, will be on the air from 161800Z (1300 EST) to 170500Z (2400 EST) on 16 May, 1959, to contact and test with amateur radio stations. Amateur contacts will be discontinued from 170245Z to 170400Z to

(Continued on page 172)

This photo shows some of the activity at the Navy's NSS during last year's Armed Forces Day activities. From these four operating positions NSS worked amateurs on the various frequencies.



May 1959

Previews of...

GALVE



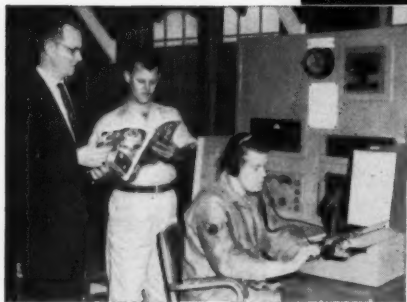
Station K5EHF of the Electronic Technicians and Amateur Club will operate on 3850 & 3950 kc. and 29.2, 50.2, & 146.85 Mc. to "talk in" visitors to Galveston who will be operating mobile/5. Members of the committee of this operation include K5EHF, HPH, EIV and EH2.



Shown in his Texas City Refining Company office is Doc Agee, W5AUN, Registration Chairman. Answers to many information requests from hams all over the country are dictated by Doc from this operating position. As Texas City RACES radio officer Doc monitors the 2-meter net at all times.



Registration ticket Number 1 is being presented to W5EYE by Bert Hepler, W5DMM, GCARC president. Although many registration blanks have been mailed to all states, additional blanks and a convention leaflet are available upon request. Address GCARC Convention Committee, Box 73, Route 1, Galveston, Texas.



Norm Bach, W5DJD, Chairman of the Galveston County Amateur Radio Club Convention Committee, meets with Major Wilson, Ellington AFB Communications Officer, to discuss Air Forces displays at the convention. At the mill of the Ellington MARS station is Corp. Maxwell.



Getting ready for the Saturday night dance are W5BRM, K5SPD, Martha Atkins, W5DMM, and Betty Atkins. The dance, which will follow a buffet supper, will be open to all registrants at no cost. Most convention activities will be held in the convention center.

STON



Bill Fulton, W5JSU, exhibits manager, drives his car onto the floor of the exhibit hall to point out to W5ERH the location of the Houston GAYLARK exhibit. Supplementing displays in the exhibit area will be several mobile communications and demonstration vehicles located in the outside exhibit area.



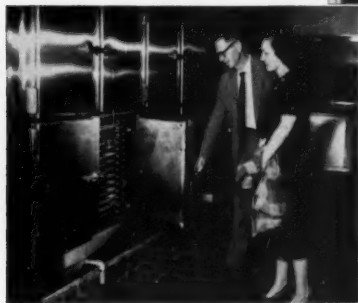
Harry Cherrad, W5ZG, general manager of the convention, followed by Norm Bach, W5DJD, chairman, descend to the lobby of the convention center on one of the many escalators.



A breakfast for licensed YLs is being planned by members of the Gulf Area Young Ladies Amateur Radio Klub. Seated in one of the many convention meeting rooms are K5PFF, K5ALF, W5EGD, W5ERH and K5BJU.



Dorothy Fulton, W5JSV, ladies' program chairman, checks program details while W5ZG comments on the AF MARS session plans with MARS coordinator W5RIH, while seated in one of the Convention Center lounges.



A behind the scenes photograph shows Gail Atkins, K5AFN, arrangements chairman, and his XYL inspecting kitchen facilities at the brand new Moody Convention Center. The center boasts of one of the best kitchens in Texas and can serve 2500 people at one time.



A highlight for many of the visiting YLs will be a coffee during the open house on board a U. S. Navy vessel to be brought into Galveston for the convention. Shown on board the USS Crow is Thelma Campbell, K5GNC, discussing arrangements with LCDR Muller.

The 11th National ARRL Convention

Galveston, Texas—June 19-21

THE 11th ARRL National Convention will be held in Galveston, Texas, on June 19-21, under the sponsorship of the Galveston County Amateur Radio Club. Cooperating clubs are the Bayshore Radio Club, Brazoria County Amateur Radio Club, Electronic Technicians and Amateur Club, Houston Amateur Radio Club, and the GAYLARKS. Amateurs in the West Gulf Division are old and expert hands at playing host to ham gatherings, as witness the fact that the event will also include the 29th annual division convention.

All convention activities except for the pre-convention party and some ladies' activities will be in the new, fully air-conditioned Moody Convention Center, which occupies a full block between the Galvez and Buccaneer hotels. Its main floor houses a large exhibition hall where manufacturers and dealers will be showing the latest in amateur gear; on the second floor are multiple meeting rooms for various activities in the program. Although not yet final, the schedule tentatively shapes up as follows:

Friday afternoon: Army and AF MARS sessions; AREC-RACES session.

Friday evening: Pre-convention beach party; also special rooms open, for the duration of the convention, for Army and AF MARS, and v.h.f. groups.

Saturday morning: Transmitter hunt; licensed YL breakfast; general assembly for formal convention opening; s.s.b. and v.h.f. forums.

Saturday afternoon: Informal luncheon; DX, RTTY, Novice and Receiver sessions; Mobile, TVI, Antenna, and Transistor sessions.

Saturday evening: Refreshments & Buffet;

Dance; Wouff-Hong initiation at midnight.

Sunday Morning: Transmitter hunt; v.h.f. breakfast; FCC exams; West Gulf Division and general ARRL sessions.

Sunday noon: Convention banquet; awards. (Convention closes about 1.30 p.m.)

Special activities for the ladies include a tour of a Navy vessel Friday afternoon; on a Saturday a luncheon, SWOOP initiation, harbor excursion tours, swimming; on Sunday morning a tour of Galveston Island.

A hospitality desk will include professional hostesses for advice on tours, religious services, etc.; talk-in stations will be on 3850, 3950 kc., and 29.2, 50.2 and 146.85 Mc. Bring your QSL card or card collection for entry in the QSL contest, and brush up on your code for the speed copying contest (or a left-foot sending contest for phone men).

Advance registration for amateurs, guys or gals, is \$7.50; for non-ham ladies, \$5. The pre-convention beach party is \$3; Saturday informal luncheon, \$3.75 (ladies' luncheon, \$3), refreshments and buffet, \$6.50; Sunday grand banquet, \$5; Wouff-Hong initiation, \$1. Send your reservation with remittance, or request for more information, to the GCARC Convention Committee, Box 73, Route 1, Galveston, Texas.

Room rates at the Galvez, Villa and Buccaneer Hotels, all adjacent to the convention center, are generally similar and are in the range \$5-\$8.50 single; \$9-\$15 double. Send your requests to the ARRL Housing Bureau, Box 59, Galveston. After June 1, fees will be slightly higher.

Combine your 1959 vacation with attendance at the eleventh ARRL National Convention: there won't be another until 1962!

QST

Left to right; the Buccaneer Hotel, Moody Center, the Hotel Galvez, and Galvez Villas.



How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Hah!

A supercilious guest of honor gazed haughtily down from the dais at the countenances of our motley DX Hoggery & Poetry Depreciation Society. He nonchalantly gulped another hors d'oeuvre followed by a flagon of Old Haywire, and listened in rapt indifference as echoes of our beloved Wouff Hong Song (cha-cha) wafted through the hall. We resumed our seats. Wonderful May! Spring's climax was confirmed with a *thwack-thwack-thwack!* as Hy Bauer, meeting chairman, gavelled for order preceding the star's introduction.

Our visitor was not overrated. After a meteoric rise to 299 countries and his triumphant acquisition of the first and only AACK! (Accumulated All Certificates Known!) award he had been toasted and lionized at polite DX assemblies far and wide. Our DXHPDS entertainment committee gloated understandably as their victim acknowledged the hubbub of the multitude below. He retrieved the few VQ7 and ZC9 QSLs that had popped from his vest pocket and resumed his manicure while we proceeded with the business portion of the meeting. O.M.Mose arose and led off with news of a broken record:

He called as a zealot inspired,
With larynx that never grew tired,
His CQ-DX —
And wha' hopen next?
The poor nitwit's license expired.

"The toast!" someone shouted from the rear of the crowd. But Melton Fusis next took the floor to . . .

Consider the crust of McSquats
Who knocks off the rarest of spots.
Skillful? No, cunning —
The reptile is running
Entirely too many watts.

More cries of "Toast, toast!" rent the air. And somebody screamed, "Where's Leo?" This disconcerted our gaudy guest but not Juan A. Workemal, who delivered:

One pea-brained lugubrious boar —
Berserk at the chance of a score —
Can't raise that Tibetan,
So pounds out upsettin'
CQs AC4-AC4. . .

Our impressive visitor paled as a curare-tipped Rettsynitch snatched off his toupee. The mob's mood moved from fun through frenzy to ferocity as ominous cracklings and rumblings reached our ears. Ivan Offalnote had to howl his verse above mounting bedlam:

I bring up for scorn Clown O'Sneex
Who ought to dry up, yet springs leaks.
While others stand by
He clutters the sky
With wisecracks and insults and squeaks.

This was it. The time had come to toast our stuffy guest and he sensed his danger too late. Suddenly he was alone on stage as a huge halo of unearthly lavender corona descended from hidden high-voltage electrodes above. *Cr-r-rack!* The lid shrieked in transfixed terror as another fiery ring enveloped him, another and yet another — *crack-crack-crack!* The tenth shattering explosion stunned him completely.

This was the signal for the release of Leo, our spirited DXHPDS mascot, from a cage behind sliding panels to the right of the rostrum. Simultaneously great steel bars clanged down between that gruesome scene and our hooting jeering throng. The gathering disintegrated into complete chaos as good old Leo thoroughly lionized our pompous visitor, a lout previously elected by secret DXHPDS ballot as undisputed DX Hog of the Year.

What:

Speaking of lions, the first day of spring really roared into the Caribbean like Old Leo. *Wow!* After an earlier agonizing unsuccessful pass at low-lying Serrana Bank, W9EVI and shipmates, including such crackerjacks as Ws 3PZW 4KVV and YN4CB, finally zeroed in with KS4BB in time to catch the closing c.w. session of the 1959 ARRL International DX Competition. Though hampered by the sheer weight of fantastically frantic pile-ups (will 14,050 kc. ever be the same again?) the adventurers turned in an ear-popping performance, a de luxe DXpeditionary production reminiscent of the granddaddy of them all, F0BAJ of Clipperton (1954). . . . So what else is new? Let's rattle the grapevine. . . .

80 c.w. gives interesting indication of a changing propagational climate if you compare this paragraph with our 3.5-Mc. rubric of twelve months ago. The range is moving 'way out, as W1s TS YIS, K2DDK (fast 22 countries worked on 80), K5LLJ, W6KG, W8YGR, W9MAK, K9ELT and K0JPL confirm in reporting CT2AI, E89J, FA9VN, FM7WU, F0SAC 11, JA1BF 13 hours GMT,



*4822 West Berteau Avenue, Chicago 41, Ill.

KM6BL, KV4AA, PJ2AE (17 kc. above the lower band limit) 6, SPs 3KBQ 8CK 0-1, T12LA, UA0LS 11-12, VK5NO 12, VP5 5FP 7BT 10-11, VR2DA 11, XE2OK, ZK1BS 12, ZL3s FZ JT 8, QX and ZP9AY. Indeed, W8-DLU had a rousing three-way with DJ2HE and ZL3QX one quiet morn. And 75-meter phone fan G2DR2 pleads for W/K/Ve fella to tune below 3800 kc. for his 35-watter, according to K2UYG. . . . Eighty-meter Novice DX news is beginning to seep in. Here's KNTDAS (now a General) with JA1UL, WH6CWI and WL7CUW (now a mere 10-foot-high dipole. And G3HZZ writes: "Tell your 3.5-Mc. Novices to listen for DX. I hear plenty of them after 0300 GMT (2200 EST) mostly from the eastern call areas up to strength Six." . . . As for 75-phone fans, a batch of W6/K6s, W7/K7s and W8KYF/5 chin with KM6L between 10 and 14 hours GMT. And European contacts grow more plentiful off the low edge down East.



OD5LX has scored nearly nine thousand contacts, a third of these with W/K colleagues, since firing up in 1953. Ted favors 20 c.w. with a 65J7-65J7-6V6-807s arrangement, an ancient HRG receiver and a simple long-wire. OD5LX signed SP1CS before WW-II and now works as chief engineer for the Lebanon army signal corps. (Photo via W8XX)

40 c.w. becomes a strange melting pot of rag chewers, traffic nets and DX pile-ups as the weeks tick off. The long-haulers doubtless are moving in strong, judging from dispatches filed by W1TS, K2s UBW UPD, K3BVV, K4s CIA PHY, K5s ABV JVF, W6KG, K6OIZ, W7s DJU VCB, K7CZX, W8s IBX YFR, W9JN, K9ELT, K0HGB and IIER who specify the 7-Mc. presence of CE3AG, CN8ME, DM2ADL 5, DU5 6TY 78V (13) 11-12, EA8BF 7, F9QV/KC, F9MNVN 23, F0BAR, FV7YI (50) 12, HA5-KFR (12), HC4HE, HH2HB, HH2DN, HL2BO, JA1s AEA BF BKV BRL BWP BZS BZC CGN CJE DY VV, JA2s AAQ BJ BP RL, JA3s AF AIS AIB AT IS QY, JA4s HM LL MM PL, JA5s ABC AK YB YG, JA8OB, JA9s BR GG, K6TSQ/KG6 (17) 10, KA2s CB (25) 12, LG, KR6s AK 10-14, BF, LZ1KPC 5-6, PH1NTB, PJ2ME, PY7AFK not Fernando but Recife, SP8CP (8), SW8WP 4, TG0AA (25) 7-8, UA0s 1 DZ 4, 3GC 4, 3KAN 5, 6VS OKK OKFG (2) 10, 0KIA 0KJA 0KUV 0LS 8-11, UB5s KBCB (35) 22, TV 4, WF 4-5, UL7GQ (5) 12, UO5s AA (3), 4, KAA (35) 22, VK9s RR XK 10-11, VP7BT, VR2DA (20) 8-10, XEs 20K 5A just Mexico, YUs in gobs, ZK1BS 11 and a few random ZS chaps.

20 c.w. whistles a merry spring tune accompanied by W1s RB (227/220), TS, K1s CCA CDN, W2s GVZ HMJ (281/275), JBL, K2s QXG UPD UYU, WA2CCC (125/53), W3LOS, K3BVV, W4s CYY JUK, K4s CIA (108/75) IGD (108/86), PHY (121/97), QH (152/132), K5s ABV JNY MHG JZP, W6s JQB KG PHF, K6s ALH (107/65), CQF LAE (153/123), TZL, W7s DJU QNI VCB, W8s CSK IBX (173/142), W9s IHN JFJ (94/73), MAK, K9s ELT (85/58), JQA (70/41), W0SLB, K0s HGB JPL (72/50), VE5 1PQ (236/220), 3EIL (76/41), F08AW and IIER. This avril chorus is swelled by outlying AC4AX in troubled Tibet (100), CNs 2BK (58), 22, BBK 8JE 8ME

8MK, CP3CD 0-1, GRs 4AX (95) 12, 5AR (20) 21, 6BX (45) 7, 7AD (30) 13, 7BS 23-0, 7CI (30), 7CR 9AH (35) 12, CTs 11D 1TT (40) 23, 2AI 2BO 3AB, DU5 1DR 1RTI (40) 14, GIV (25) 12, 7SV (95) 12, EA8s 8BF (83) 22, 9AP (40) 15, 9AQ, ET2s KY 1-23, VB, FAs 3AF 3DU SRJ 0VJ, FB8s CL 23, XX (45) 13-14, FF8CI 6, FG7XE 22, VK5s 5-6 and 12, FM7WP (55) 0, F08s AC (90) 12, AU, F08s AP AY, FS7RT, FY7s YF YI (50) 12, GC2FZC, GD3UB, HA8s 1KSA 5KFR 6, 0HN, HC8s IAGI 4IE (30) 4, 5CN 2, H8B8E, HKs 3TH 5SG (30) 2, 8AI, HL2AC (25) 12, HR-2FG, HSIC, HZ1AB (325) 4, IT1s AGA 3, CDS TAI, JA1s AB ACA AG BF BLM VE VE/8 VYX, JA2s DO GX LK, JA3s AF MR, JA4s AA HM GP PL, JA5s AF 6AP 3, 6CI 6CS 7AD 7LA 8AA 9AA, JZ0HA (60) 12, K6QCP/KW6, KAs 2AC 2CB (25) 12, 2LN (65) 13, 2MF (50) 12, 2QT 2RS 8KW (55) 12, 9MF (25) 6, 0CG 0UJ (40) 12, K6JC (15) 13-14, KGs 1DO (77) 2, IEM (90) 22, 4AI, 6AAV (50), 6AIF (95) 13, KM6s BK (9), BL, KR6s AC (40) 13, AK 14, RY (40) 14, KV4AA (81) 21-23, KX6s AF 12, CO (65) 4, 12, CW 11-12, LAs 1VC/8 7 of Antarctica, 2CG/p and 2JE/p (35) 7 of Swabland, LU5 1ZA 3ZX of Argentina's icebox, LZs 1KBA 1KPC 1KPK 1UR 2KBB 7, 2KSB, MP4s DAA TAC, OA1s FA FM, OD5s CI (90) 5, LX, OQ5SE (60) 19, ORAVN (6) 23 of the Belgian antarctic, OX3s AY (3) 13, UD, OY7ML 22, PJ2AX, Fernando da Noronha PY7s AFN and SC (50) 21-22, PZ1AP, RAEM of Moskva, SM5WN/LA/p (20) 4-10, SL8AY/mm aboard a Swedish training ship, SU1s 12, 23, 28, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

20 phone presented BVIUS (160) 15, CNs SJE* 9CJ, CX5AF* (305) 1, ET2BP*, FP8AP (160) 18, HKs 1DK 3DB 8AI of San Andrea delight, HR2DK, HSIE (165) 15, HZ1AB*, KAs 2YA* 9MF (180) 14, KC6CG, KGs 1DZ* 4AL, KL7FAZ (210) 14, K6ABT, OH8NC* of the Alands group, OY7ML*, PJ2AV*, SP3s PL* 8SQ* (266) 21-22, VE3EGD/SU, VP5s 2DX 9EP, XEs 1H* (310) 3, 0G0G, ZC4AM* (305) 21, 5A5TO and 9M2FR (140) 14 to redoubtable K1s CCA CDN, W2VZY*, K4s CIA QJ*, K6RAH, W7VCB, W8IBX, K0s HGB TAO and VE1PQ*, the asterisks denoting single-sideband samplings.

15 phone is more fruitful although K6CQF goes on record to say, "Conditions are not as good as last year." Anyway, reporters K1s CCA CDN, W2ETU, K4s PHY QJQ RSD (85), TTF, UTI, K5s JCC (130/100), JTP JZP, K0s CQF LAE OQT, W7VCB, K9GSG, K0JPL and OA4DE collected CE8ZG, CN8s FA FV JC 1, JE, CP1CJ, CR6AG, CR6AL, DU5s IGF 78V (23) 12, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930,



VK2FR was just another Aussie until ARRL's DXCC Countries List annexed Lord Howe Island last year. Now Trevor basks in a spotlight of concentrated r.f., this glare alleviated only periodically when DX hounds from the mainland arrive for DXpeditionary work. (Photo via W6YY)

W6s JQB KG, K6s LAE OQT, W7s DJU QNI VCB, W8s CSK IBX YGR, W9s JJJ MAK, K9s GSG JQA, K0s HCB JPL, VE3EIL and IIER specify the raisability of BVUUSB (32) 4-5, CE3AG, C8s 2AE 8DJ 8JE 3, 8JX 8MK, C8s 5AR (95) 0-1, 7BS, C7s 1JL 3AB (16) 17, C8s 2BT 7CO 1, DU7SV (103) 3, EA9s AD AP (5) 2, EL1s K 3, P 12, ET2s KY (24) 19, VB (30) 16, F9QV/FC, FAs 8ZZ 9VN/sh, FB8ZZ (46) 16, FB8BF/sg, GC3HFE, HA5DH 18, HC1ET 2, HK0A1 (100) 21, HRs 3MW 8AA 0, HZ1AB (52) 1, IT1AGA, JAs 1BF 1KF 3AF, KG1AQ, KM6BL, KR6s AK BF (70) 3, KV4AA, KN6CW (92) 4, LJ2F, LZ1ENB, OD5CL OH0s (90) 17, OQ2s CP (30) 18, LL, OX3RH, PJ2ME, of Sint Maarten, SL3AG of the Swedish forces, SM5WN/LA/p (57) 2-15, SV6s (88) 13-19, WT, TF3PI 0-1, T12RO, UAs ICC (26) 16, 1HR (45) 13, 1KAQ 4KCE 9GB (50) 13, 9KYB 2, 9VB 6GF (80) 4, 0KAR of Dickson isle, 0KFG 0K1A (50) 4-5, 0KSA, UB5s KBV (92) 17, K1A (35) 17, WF (100) 13, UNIAE, UQ2AS 15, UR2s DX (103) 16, KA KAE 14, VK9s AD (67), XK (95) 4 of the P.T., VP6s 4LA 5FP 8CV (55) 23, 8EP (85) 1, VOs 2AB 19, 3CF (20) 18, 5FK (34) 20, 6LQ, VSs 1GZ 15, 6DS 4, 9MB (60) 18-19 of Gan, XZ2TH (23) 19, YV5GY, ZC4s 1P 21, RP, ZD1FG, ZEs 1JV (50) 20, 4JH 5JE (10) 20, ZK1BS, ZPs 5AQ (55) 21-22, 9AY, 5As 2CV and 3TQ.

15 Novice notes are noteworthy, filed by KNs 11FJ (30) worked, 1IMP (now Generalized at 28 countries), 4YGS 4ZIW 5PYX 5RQ1 (40 snagged), 6TUN 0REV, WVis CGB and CPI (12 and 5 continents) and dealing with the likes of CN8IX, CQ2BL, CX3BH, DM3s KSH KYN 22, DU7SV, EA5 5EH 71A 8AI, FA9UO, HL2AG, HP1AL, HZ1AB, JAs 1TD 3AQ 3BP 5TF 6FB, KA2RB, KR6CA, KW6CE, KZ5LSN, LA3 3WG 4LE, OA4s BP FT N, OD5LX, OX3s FF RH, PI1NTB, SP5AR, TI2LA, UAs 1TQ 0K1A, UB5WF, VKs 2JX 3JV, VP6s 2AB 2GS 3MC 5AK 6GC 6XZ, VQ2DC, VR2AR, W7KLD/KL7, WH6DBF, WL7s CRL CRW, WPs in force, YN1FF, YUs 2QZ 3CP, YV5HL, ZB1DC, ZEsJU, ZIs in quantity, Zss the same, and 4X4DI.

10 phone will thin out now for its summer siesta but a spring surge satisfied the DX urge of K1s ADH CCA* CYN DIW, K2UYG, W3QIR (109/96), K3AMH/4 (116) 90, K4QLJ, W7VCB, W8s GKB IBX YGR, K8KHIE, W9PJT, K9SGG, K0LEQ, GC3RS and OA4DE with elegant sufficiency. How? With CEs 2AN 2CC 22, 3GI 3HL, CN8s AB FV 13, JE ME, COs 2CL 5CN, CRs 4AV 6CA 7AQ, CT1QF, a flock of C8s, FAs 8AH 8CF 12-13, 8CN, EL8D 19, FA2BV, FB8AP/na, F87RT, GC2RS, GD3UL, HCs 1AGI 1ET 1FO 1WP 7WK, HH2s LD Z 20, HINGA HK7AB 13, HP1AC, HR1AB, JA1OP, K6QPG/KW6,

KA8 2UJ 8LF 0IJ (415), KB6BK*, KC6CG, KC4AR, KJ6BV, KM6s BI BK BP, KX6s AF BP*, LX1s HM JW 14, OA4s DE HK V 13-14, OD5AC, OQs SAC 5DQ 5FV 13, 0DM 8PD 21, PJ6 2AL, 2AQ 2AX 3AD 12, 3AG, TG9TS, T2s GO OB WD, UAs 1GF 14, 9K2A, 0L4, UR2BU, VE3EGD/SU, VP6s 1EK 1SD 2AB 2DA 2DX 16, 2GV 2LS 20, 3HAG 17, 4LA 4LG 4TF 5AA 5AB 17, 5CB 6EB 7BO 9DC 9DU, VQs 2VG 4ASC 4GQ 20, VR2BC, VS6BJ, XE1s galore, XE3AF, XW8AL, YNs 1FF 1JZ 22, 4CB 21, YSIMM, YUIUS, YV3s AA CB, ZBINR, ZDs 1FG 7SA, ZEs 2KR 6JL, ZP6MQ, ZLs 1ADA 1M4 3JO, ZS2AG (250) 19, 4X4FL, 5As 1F 14, 9K2A, and 9M2GA, the stars indicating a.s.b. action as usual.

10 c.w. simmers down after a pleasant equinoctial period. W1s KRVT TS, K1s CCA CDN DIW (45), K2s UPD UYG, K3AMH/4, K4s CIA PHY, W5KNE, K5ABV, W6s JQB KG, W7VCB, W8s CSK KX (153/138), YGR, K8KHE, W9MAK, K9s ELT GSG JQA and IIER showing up with CE3AG, C8s 2BK 8FJ 8JE 8ME, CO2US, CR7BS, C7s 1TT 3AB 16-17, DM2s KBE KEK, DU7SV, EA8BF, F9QV/FC 16-17, F08s AC 0, AK, GB2SM just England, GD3UB, HAs 5KAG 18, 8WS SWZ, HZ1AB, IT1PA 17, JAs 1BI 1BVX 1VX 3AA 5AF 7AD, K7TSQ/K6s, KA2s BE KS, KM6BK, KR6s AK 1, BFEO (82), KX6s AF CW, OD5CI, OQ5IG 17, PI1NTB, PJ2ME, SMs 1BVQ 5WN/LA/p 2, SPs en masse, SV0WP (80) 14, TF3s AB 15, KG PI, UAs 1DZ 88s 15, 1TQ 3DB 0FR 0K1A 0-1, UB5s KA KAB TK WF, UQ2AN 15, UR2s KAA KAE 14, KCA 14, VE0NI, VP7BT, VS6D8 23, 0V5HL, ZC4IP 18, ZD2-HAH, ZK1BS, ZP9AY, 5As 2CV and 3TQ.

160 c.w., though quiescent on the North Atlantic paths, displayed interesting February and March developments in other directions. Outstanding QSOs reported by W1BB in his invaluable low-band bulletins: W6KIP and HC1HE at 0600 GMT on the 1st of March, a contact heard by ZL3RB; K6HXT and the same HC4; W8ANO and ZL3RB around 0900; and W9PNE made it to KH6JJ in late February. VP3AD logged lots of W/K/VE brethren but they didn't hear him around 1801 ke. VP6s 7BT 9DM and 9EP (also were in there slugging), the former heard by ZL3RB. A VP2VA-VEZAT QSO was overheard by K2UBW. All in all, the 18-Mc. gang made the best of a stubborn season. Just wait till next year — or before!

Where:

Africa — OQ5EIT of the Union Congolaise des Amateurs de Radio advises via WIUED of ARRL HQ, that your OQ cards now can go via UCAR QSL Bureau, P. O. Box 3748, Elizabethville, Belgian Congo, a new address. "I have agreed to act as QSL manager for ZS8RO and XYL ZS8SM who planned two weeks of Swaziland operation in March, S.A.s.e. are a must." That from WIUED. "CR6CA returned my IRCs," writes K1ADI. "He now uses sea mail direct rather than air mail." From FB8BC via W8KX: "In 1955, '56 and '57 a pirate used the call FB8AX. All efforts failed to locate him, however, and I received more than one hundred QSLs for FB8AX QSOs." That call had been defunct since the original FB8AX on Terre Adelle became FB8YI in 1953. "Beginning February 6, 1959, I will handle ZB8JTs QSLs for the U.S.A. and possessions," writes W6UNP. "He plans to forward his log, or copy thereof, to me each week with full QSO data. ZB8JJ began operation at Causeway last December." "VQ6LQ tells me he has a batch of new cards," says WIICP. "Charles mentions that it takes three IRCs for second-class air mail to the States, eight for first-class air mail." K4QLJ, others learn that Z17SA transmitted no sideband prior to March of this year, spurious evidence notwithstanding. W9FJY continues to assist Bob with QSL matters, aided by K9PJN, and expects ZD7SA to join the a.s.b. fun for real one of these days. W8KX quotes 5A3TQ on the outskirts of Tripoli: "Being a civilian here, and our QSL bureau being at the air base to which I hold no pass, I must rely on the generosity of the QSL club to collect my QSLs."

Asia — Via WIUED we learn that the Gan Amateur Radio Club, VS9MB, will do honors for outstanding VS9MA

"How about a certificate for working and confirming 6000 Stateside stations?" inquires VK9AD, easily eligible for such a sheepskin. "WAS already is in the bag here for c.w. and a.m. but I await a few more States for a sideband sweep." When not busy gratifying W/K/VE DX appetites Stan manages an occasional addition to his own 167/127 total. VK9AD's neat Norfolk installation feeds a triband quad, 14-Mc. s.s.b. preferred at present. "I'm scheduled to leave the island in October, destination possibly VK2, but my tour of duty may be extended a further two years."



QSLs — Regarding this operation in this year's ARRL Test, HZ1AB operator Bud McClure suggests the QSL route: HZ1AB, Opr. Bud, APO 616, New York, N. Y. "In this manner I will be assured of receiving all of these cards and will see that they are answered." — "Effective May 1 I will handle all American QSLs for V86AZ," declares K6GMA. Self-addressed stamped envelopes, naturally. — "My compliments to XW8AL on his fast QSL, dispatched the day after contact," applauds KIADH. — OD5LX outlines his Yank QSL policy to W8KX: "Incoming cards can arrive direct or via bureau, outgoing cards go first class to ARRL QSL bureaus by surface mail." Ted emphasizes, "No dollar bills, either. To QSL is a duty and a pleasure at the same time." — XZ2TH assures, "There is no QSL manager for my station anywhere. I receive cards direct only, and I guarantee a return QSL for every valid card received." — As of this month W9QVY may be able to help you out concerning BV1A confirmations. Apparently he was in fact on Formosa. — From W4ML: "ZB2A/V89 QSLs are being mailed to those who were considerate enough to enclose self-addressed stamped envelopes, and only to those who appear in Bob's log. Many cards were received for QSOs not corresponding to proper dates of ZB2A/V89 operation." — K6LAE, observing that W9CAE left the KA0IJ Two staff around the 1st of March, states that Ted has his chunk of KA0IJ log with him in Aurora, Ill., and will welcome QSL inquiries.



Geopolitical developments on the once Dark Continent now make press headlines, adding to the luster of such rare activations as that of FE8AP. Pierre expects to conclude his French Cameroons assignment for return to France next month. (Photo via W9WHM)

Oceania — "Please mention that I am still QSL manager for VS4UT," requests K6GMA, which we hereby do. — KJ9VF learns from K6LKV that he handles no QSLs for KH6s operating fixed-portable in Samoa. Also, the call KH6SS has not been legitimately used for quite a spell. — "I still handle all cards for VR6TC," affirms W4-TAJ, "and no one who has actually worked Tom has to wait more than twenty-four hours for a card after I receive the logs here. Incidentally, I find an average of about five hams a month who try to squeeze VR6TC QSLs out of me on the grounds that they 'think he came back' to them." — Don't neglect the s.a.s.e. angle when consulting W2CTN about JZ0DA and other pasteboards. — VK9AD discusses his QSL procedure in some detail. "I return a card by air mail upon receipt, provided postage is defrayed. I do not favor use of the bureaus because I don't like the amount of unsorted mail coming in with receiving upward of 400 cards per batch. The time spent in processing such a number I could spend on the air. Six thousand VK9AD QSLs now are floating around Stateside, so I have enough of a chore handling cards with covering postage included let alone those without!" — W8CSK is assured by ex-KB6B (W3PZW) that Dick's Canton QSL backlog will be reduced in good order, some eight kilo-QSOs' worth. — "I handle QSLs for V85BY," advises W6ZEN. "S.a.s.e. are required or cards go via bureau." Floyd also has it that disastrous weather may cause a break in ZK2AB's QSL continuity — see "Whence".

Europe — "In August of last year I managed to combine the family holiday with a slice of operating as 3A2CF, which I thoroughly enjoyed," reminisces G3ZY. "But on my return home I found that my activities had been preceded by a pirate using the same call. A lot of W/K cards have come to me for contacts made with this fellow. I have replied, explaining the position, to those who enclosed

IRCs. To all others I made me say, 'better luck next time.' Only 3A2CF contacts made between the 4th and 17th of August are genuine." — W7QNI informs, "UA4KAB operator Albert Perliutko appreciates QSLs sent to his home QTH (which follow) because he collects stamps. He promises return cards direct." Paul also finds that Swiss postal authorities don't seem to savvy those reply-paid international postals. — It pays to attend to minuscule details in addressing QSLs. G3HZL, for instance, may get no delivery if "Flat 3" is omitted from his otherwise apparently complete address. — "All QSOs of DL7AH/LX — 1710 of 'em — have been verified. Those who have not answered our QSLs are admonished to do so. Card stock is still available to replace those which may have gone astray." Harry hopes to revisit Luxembourg operationally again this year. — From friend OY7ML: "K6AXS has QSL'd every station who worked me on s.s.b. and I hope to receive a reply from each, direct or via bureau." — ZB2A station manager Steve McClelland tells W1LLF of ARRL that this Gibraltar minuteman issues from the station a thousand QSLs yearly. The ZB2A gang stresses these pasteboard points: (1) contacts desiring fastest reply should be careful to include sufficient IRCs to cover return air mail (three coupons each for W/Ks), (2) QSLs received by bureau are answered likewise, and (3) all QSLs for bona-fide ZB2A QSOs are answered 100 per cent. — G3MNO, who uses 160 meters only, apprises the QSL gang that he will be aloft in connection with the use of his call on higher frequencies. Or else a G with similar label is careless in identifying himself. — G3CQE, as GB3GD on Man Isle, was hoping to encounter a few non-QSL types who need that country. K9ELT hears he's a frustrating 40 countries shy in the confirmed department.

South America — G8KS regrettably advises that the DX logs of the State Ward, V88H, FKASAT, JZ0s DA HA, located. — I have also been the accommodation address for Colin Johnson, VP8CC, who is now most likely on his way home to England. I forwarded a last batch of cards to him in October — he has but one ship per year. QSLs I have received since then are being held until Colin arrives. — K2AYC finds that the street address of FY7YI (see following) is a requirement when addressing QSLs to Paul. Earlier versions of his QTH failed to specify same. — "Tell Jeeves to tell the gang that my PY0NA cards for October and November Trindade Island DX-peditionary work began mailing in late February." PY1CK also indicates that further PY0 activity is in prospect. — PJ5AA, home at G5RV now, informs W7QNI that all his Netherlands Antilles work has been QSL'd but that quite a few cards evidently went astray in mail. — CE3GI assures KIADH that Radio Club of Chile's 6500-or-so Juan Fernandez QSOs with 130-odd countries in February by CE0s ZA ZB ZC and ZD are being steadily confirmed upon QSL receipt.

Reheats — Latest available scorecard on QSL service provided by W2CTN: CR4H, FKASAT, JZ0s DA HA, KW6C, VQ3RH, VQs 2AAY/1b, 2FR 9BW 9ST, VP6PJ, VQs 2EW 3CF 3HH, VR2s DA DK, ZB2L, ZD2DCP, Z87M and 9G1BQ. Whew! Jack also does non-W/K duties for FM7WU. This commendation from DXpert W2HJJ: "Ran out and saw W2CTN's QSL bureau. The guy deserves a lot of credit for doing such a fine efficient job. But too many hot-shot DXers send him cards without self-addressed stamped envelopes and that's a pity. It's being my own personal comment." Aug also noted that W2CTN went to the trouble of having a large batch of QSLs made up for CR5AR but the latter failed to close the arrangement (W2CN assists CR5AR). — T21HP wants it clearly understood that his Cocos Island work (T19s CW and SB) "is strictly an amateur expedition and we do not solicit nor want any 'contributions'. QSLs will be sent to all stations worked. Those who wish their cards by air mail should supply self-addressed envelopes and four International Reply Coupons each. Those who desire cards returned direct by surface mail need enclose only self-addressed envelopes. All other QSLs will go via bureau." — K9ELT hears that a few unscrupulous individuals are attempting an old congame in trying to fatten their countries-confirmed tallies. The theory is: Spray enough QSLs, with or without dollar bills, around the world, bearing the appropriate TNX-FOR-QSO legend, and you're bound to save yourself some pile-up fatigue. The catch is: It takes only a few tip-offs from increased DX operators to inspire full-scale investigations and world-wide log checks of the QSOs claimed by such deranged dunces. The result is obvious. — "Got a fast reply on my FM7WU mail to W9YSX," beams W6MAK, "s.a.s.e. of course." K6ALH, W9s JFF and MAK offer their services as QSL agencies for rare DX ops in true need. — W4CXA tells W8CSK that QSLing for his HR1-2-3EXF junk tent worked forward upon delivery of appropriate QSL stock. — Newcomers, changes of QTH, etc., for your pleasure:

BV1A (via W9QVY)
BV1US, APO 63, San Francisco, Calif.
BY1PK (via LZ1AF)
ex-CN8MM (via LABRE)

ously with the reforming of the club after the departure of Don Tranter, W9RMA, we also managed to find a better shack. After a hectic afternoon of moving we strung up

manage to do exceptionally well with the States, however, and always have a queue. I run a DX-35 and have an Eddy-stone receiver. I don't use company equipment because our

This QSL's-eye view of ZL3RB, contributed by W1BB, introduces us to New Zealand's outstanding 160-meter DX-perimeter (visitor VK2AXH-ZL1AUL appears at right). Climaxing a year of propagational perseverance, ZL3RB and W6KJP clicked on mid-February 1.8-Mc. schedule for a joyful 20-minute two-way. This transpacific triumph somewhat compensated for a generally poor 1958-59 160-meter season along U.S.A.-Europe paths. ZL3RB employs a hopped-up BC-342, a v.f.o.-6146-813 combo modulated by four 1625s, and a 560-ft.-per-leg Vee.



CO2DD (to CM2DD)
CR4AH (via W2CTN)
CR5AR (W/Ka via W2CN)
DU6TY, P. O. Box 9, Roxas City, Iloilo, P. I.
EA9DG, P. O. Box 345, Aaiun, Spanish Sahara, Rio de Oro
EL2G, W. Upshur, c/o U. S. Embassy, Monrovia, Liberia
FA2VB, M. Avella, Ecole de Garçons, Cite Petit, Oran, Algeria
FB8BS, A. Ladner, Box 1691, Tananarive, Madagascar
FB8CI, Box 8123, Dakar, F.W.A.
FG7XF (via REF)
FY7YL, P. Canavy, Rue des Ramparts, Cayenne, Fr. Guiana
GB3GD (via K9ELT)
HC1FO, c/o U. S. Embassy, Quito, Ecuador
HC1RY, R. Lopez, P. O. Box 581, Quito, Ecuador
HC5CN, Tesar Nieto, Box 219, Cuenca, Ecuador
HK8AL, V. Abraham, San Andres Island, Colombia, S. Am.
HL2AC, College of Engineering, National U., Seoul, Korea
HPIAC, Box 354, Panama City, R.P.
HRI-2-3EXP (via W4CXA)
IEZZ/MI (via IIDFC)
JZ0DA (via W2CTN)
K4SCW/mm, M/Sgt. R. L. Hoyt, USAF Vessel C-38-1862, Pier 8, Waailaven WZ, c/o Van Brink Ltd., Rotterdam, Holland
KA0IJ, APO 815, San Francisco, Calif. (see preceding text)
KC4USX, AirDevRonSix (VX6), Navy 20, Box 911, FPO, San Francisco, Calif.
KM6BK, H. Pickerill, Navy 3080, San Francisco, Calif.
KP4CGB, J. Browning, USCG, Box 2029, San Juan, P. R. ex-KR6LP (to K6EIV)
KV4BO, E. M. Turner, ex-KP4WN, St. Paul's Rectory, Frederiksted, St. Croix, V. I.
KW6CL, R. Drake, P. O. Box 26, Wake Island
KX6CO, 1960th AACs Sqn., Box 11, Navy 824, FPO, San Francisco, Calif.
LU5OJ, T. Sotelo, Campaneto, Y.B.F., Vespucio, Argentina
OO9DM, R. Dethier, OQ5DM, P. O. Box 42, Usamburu, Rianda-Urundi, Belgian Congo
OY1J, J. Gerdall, Kiakavig, Faeroes Islands
PJ3AD, E. Carroll, Box 52, Seroe Colorado, Aruba, N. A.
PY7AFN (via PY7AA)
PY0NE (via PY1HQ)



Pat O'Brien of VS6AE fame consistently bridges the Hong Kong-U.S.A. gap via several bands and modes. (Photo via W2EQS)

ST2KO, Dr. M. Dransfield, Cotton Breeding Section, P. O. Box 30, Khartoum, N. Sudan
TI9s CW SB (to TI2HP)
UA4KAB, A. Perhutko, Postbox 19, Stalingrad, U.S.S.R.
VK9AD, S. Davies, Norfolk Island via Australia
VK9JG, Box 55, Rabaul, T.N.G.
ex-VK9LE (via VK6MK)
VK9ML, P. O. Box 55, Rabaul, T.N.G.
VK9AT (via VK6RU)
VP2GDW (via KV4AA)
ex-VP9DP (to K9JVR)
VQ2EW (via W3CTN)
VS4JT (via K6GMA)
VS5BQ (via W6ZEN)
VS6AZ (W/Ka via K6GMA; see preceding text)
VS9MB, RAF Amateur Radio Club of Gen. RAF, BFPO 180, Malville Islands via Ceylon
W4JRD/K54, J. Galbraith, 202F Stadium Apts., Key West, Fla.
XE2OZ, E. Richer, Box 34, Laredo, Mexico
XE4B (via LMRE)
XE5A (via XE1DY)
XY1OM, M. McCutcheon, c/o J. Regan, VR2AZ, P. O. Box 236, Nadi Airport, Fiji Islands
YNICK (via W1EQ)
YN4CB, H. G. Patricio, P. O. Box 4, Bluefields, Nicaragua
YN4DLS/mm (via W4KXV)
YN4TS, H. Stokes, P. O. Box 1089, Managua, Nicaragua
YS1IM, J. Giammattei, P. O. Box 190, San Salvador, El Salvador
YU1S, R. Rudie, 27 Parecticeva, Subotica, Yugoslavia
YV5AX, G. Ives, P. O. Box 1827, Caracas, Venezuela
ZB2A/VS9 (via W4ML)
ZB2I (via W2CTN)
ex-ZC6UNJ, P. Altdorf, UN MoGip, 216 Sale Rd., Rawalpindi, Pakistan
ex-ZD1SW, S. Walti, 4895 Walkley, N.D.G., Montreal, P.Q., Canada
ZD2CKH, K. Harrison, P. O. Box 38, Jos, Nigeria
ZE8JJ (W/Ka via W6UNP)
ZP5AO (via RCP)
ZS8s RO/7 SM/7 (via W1FFO)
3A2CZ (to ON4QX)
3V8AC, Essid Abd Ali, rue Rekeb Impasse Joupa, Maaken, Tunisia
5A2CV, RAF Stn., El Adem, BFPO Box 56, via London, England (or to G3BBF)
9G1CF, Dr. H. de Glanville, P. O. Box 4, Winneba, Ghana
Bless W1s AW ICP KRV TS UED VG WPO, K1s ADH CCA CDN, W2s HMJ JBL, K2s AYC UYG, WA2CCC, W3QIR, K4s DIA DKX PNY, W5KNE, K5JCC, W6s JQB KG PHF, K6s CQF LAE LKV OQT, W7QNI, W8KX, W9JJN, K9GSG, VE3EIL, PY1CK, A. Ruge, DX Club of St. Louis, DeRidder DX Club, International Short Wave League, Japan DX Radio Club, Northern California DX Club, Ohio Valley Amateur Radio Association, Southern California DX Club, VERON's DXpress, West Gulf DX Club, Willamette Valley DX Club and the Wireless Institute of Australia for the foregoing fingerwork.
Whence:
Asia — Wandering K4SCW relays word from H.R.H. the Prince of Sikkim, AC3PT: "There is but one operator on the air here at present, AC3NC, and it is likely that another station will go on in the near future. Bhutan has AC3PN active and another likely operator is AC58Q. Recently there have been many pirate ACs and, so far as I am aware, there are no other AC3 or AC5 stations. Under the present political situation no foreigners apart from specially screened Indians are allowed to operate." ACs 3NC and 58Q are better known as earwale ACs 4NC and 38Q
----- Gian's RAF gang, V89MB, informs: "Simultane-

VQ2AB's six-month leave will take him through much of Europe and Africa, including stops at St. Helena and Ascension, operating intentions negligible. . . . From 533TQ (G3FJU, ex-9K2AQ) via W8KX: "DX conditions are poor for me, mainly because I'm using only dipoles and am unable to cut out European QRM. But 555TO, a great phone fan, has his own special quad version and does very well."

Monterey. The call FOSAW was granted to me by the Tahitian government while I was visiting the islands.'
 DXCSL, NCDXC, OVARA, VERON, WGDXC
 and WIA contribute Oceaniagrams: FOSAX (WA6DEH)

(Continued on page 186)



First "DXCC²" qualifier in our ninth call area is W9KXX (see page 59, April 1957 QST) who follows DL42C, VS 4LWV 6GPB, CE3DZ, HB9J, VS 5KC and 7ENW for the eighth such accomplishment recorded. Here you'll note colorful QSLs from scores of prominent ARRL DX Century Club members around the world. Who will be next to ship us a valid photo of aggregated confirmations from fellow DXCCers in 100 or more DXCC List countries?



CONDUCTED BY EDWARD P. TILTON,* WHDQ

THIS is for the v.h.f. newcomer. Old hands at the game don't need to be reminded of it — they've been waiting patiently for several months now for May to roll around again.

If things have been a little quiet on your favorite v.h.f. band lately, keep heart. Better times are coming, if they are not already here. Come high or low sunspot numbers, spring brings joy to the v.h.f. enthusiast. You're about through working worldwide DX on 6 for at least 6 months — or maybe 10 years or so — but if this is your first spring in ham radio you've got some new thrills in store. Whether you're on 50, 144, 220 or 420 Mc., this is the season!

While it is certainly true that the v.h.f. man does not live by DX alone, it is nice to hear signals from outside the local range coming in stronger again, and with them other signals from greater distances than we've heard in months. Other forms of DX may still be largely unpredictable, but here's a kind that you can almost count on, once you understand a little of the correlation between weather conditions and bending of v.h.f. waves. Familiarity with weather patterns, frequent observation of temperature, wind velocity and direction, and barometric pressure, plus regular study of the weather maps, will soon put you in business as a tropospheric DX prophet. The special feature of tropospheric bending is that it usually increases with frequency. If 50 Mc. is good, 144 is often better — and 220 and 420 may be better still. Weather-induced wave bending often brings in 2-meter signals from distances that are seldom or never spanned by this medium on 50 Mc., and it is reasonably sure that we've hardly scratched the surface of our opportunities on the higher bands in this department.

If you're a 6-only man you've probably had your fill of DX in the past several months, but wait till you run into your first real sporadic-E skip session! Here is something that nobody really understands yet, and that very unpredictability is the source of much of its interest to v.h.f. men. How is it related to solar activity? Nobody really knows. Why do some years produce only short, widely-scattered openings, with weak signals flitting in and out before decent contacts can be made, yet other seasons feature openings that last around the clock, with every corner of the country being heard in a matter of a few hours? Again, nobody knows, for sure.

Good sporadic-E skip openings have developed as early as April 15, and yet other years there may not be too much doing until well into June.

* V.H.F. Editor, QST.

There is hardly a distance over 300 miles that cannot be worked at some time during a good E_s season, so if you have despaired of working some of those states that never quite made it during the best of the F₂ DX, this spring may give you your chance. Most of the first 20 or so holders of 50-Mc. WAS made it without the help of F₂ DX, so don't sell sporadic-E short.

50 Mc. WAS

1 W6ZJB	17 W6OGW	33 W6PFP	49 W6FKY
2 W6BJV	18 W7ERA	34 W6BJI*	50 W6LPD
3 W6CJS	19 W30JU	35 W2MEU	51 W6ZTW
4 W5AJG	20 W6TMI*	36 W1CLS	52 W6GCG
5 W9ZHL	21 K6EDX	37 W6PUZ	53 W2RGV
6 W9OCA	22 W5SFW*	38 W7ILL	54 WIDEI
7 W6OB	23 W6ORE	39 W6DDX	55 W1HOT
8 W6INI	24 W6ALU	40 W6DO	56 W6ANN
9 W1HDQ	25 W8CMS*	41 K9DXT	57 W1SUS
10 W5MJD	26 W6MVG	42 W6ARN	58 W1AEP*
11 W2IDZ	27 W6CNM	43 W6BAL	59 W5LFH
12 W1ILL	28 W1VNH	44 VE3AET	60 W6ENZ
13 W6DZM	29 W6OLY	45 W9JFP	61 W7MAH
14 W6HVV	30 W7HEA	46 W6WIN	62 W6ESZ
15 W6WKB	31 K6GQG	47 W6WWN	63 W2BYM
16 W6SMJ	32 W7FFE	48 K9ETD	64 W7ACD

*49

VE7CN	45	XE1GE	30	LU9MA	26	LATY	20
KL7AUV	44	K1H6CTC	30	ZSRG	26	VQZPL	18
VE1EF	42	SM7ZN	29	CTICO	24	JAKAO	18
VE2AOM	38	P2IAE	28	SM6ANR	21	JASBU	17
KH6UK	37	SM6BTT	28	CO6WW	21	JALAA	17
E1ZW	37	CO2ZX	27	LA9T	21	JALAUH	16
VE4HS	41	ZE2JV	26	SM5CNN	20	ZE2JV	12

If you would get the most out of what is in store for this spring and summer, here are a few hints. First, tune for *weak* signals. The fellow who never answers anyone unless he is 40 over 9 misses half the fun. Stations 600 to 1200 miles away can be worked with the lowest power and simplest antennas, but the close-in ones may come harder. And when the band is loaded with S9-plus signals from the optimum distances there may be other and weaker signals coming through from roughly twice the distance, by double-hop propagation. Watch for them when the single-hop signals are strong and steady, or just as they begin to fade, in the late morning or middle evening, particularly.

When the band goes dead, or seems to, don't quit. The skip may merely have shifted to an area where activity is low. This is the time to limber up the key, and call some c.w. CQs. It is also the time for careful listening. That weak fading signal in there just might be Nevada, or New Mexico, or Vermont — or one of the others you've been waiting for so long.

If Spring, 1959, turns out to be a really hot season for E_s, the 2-meter men may have a chance now and then, too. Close observation of 6-meter

2-METER STANDINGS

Figures are states, U.S. call areas, and mileage to most distant station worked.

WIREZ	30	8	1175	W5CVW	11	5	1180
W1AZK	24	2	1205	W5XDE	11	5	625
W1KCS	24	7	1150	W5VY	10	3	1200
W1RUF	23	7	1120	W5SWV	10	3	600
W1AJR	23	7	1130				
W1HDQ	20	6	1020	W6NLZ	12	5	2540
W1MMN	20	6	900	W6WSQ	12	5	1390
W1WZY	19	6	875	W6DNG	9	5	1040
K1CRQ	18	6	800	W6ZJF	6	3	800
W1AFQ	17	6	920	W6ZL	5	3	1400
W1ZJQ	17	6	860	W6MMU	3	2	950
W1CLH	17	5	450				
				W7VMP	15	5	1280
W2NLY	37	8	1390	W7JRG	9	4	1040
W2CNY	37	8	1360	W7LHL	4	2	1050
W2ORL	37	8	1250	W7JJP	4	2	900
K2GOL	30	8	1200	W7JUN	4	2	353
W2AZL	29	8	1050				
W2BLV	27	8	1020	W8KAY	38	8	1020
K2TJF	25	7	1090	W8WVX	35	8	1200
W2AMJ	25	6	980	W8PT	34	8	985
W2DOW	23	6	860	W8LOF	33	8	1090
K2HOD	23	6	950	W8RHH	32	8	910
W2PAU	23	6	753	W8SVI	30	8	1080
W2SMX	22	6	940	W8SPG	30	8	1000
W2CEH	22	8	910	W8LPI	29	8	850
W2WLI	21	6	700	W8WVW	28	8	860
W2RNG	20	6	700	W8WRN	28	8	680
W2TTH	19	7	880	W8HAX	27	8	960
W2RGV	19	6	720	W8XDN	26	8	720
W2WZR	18	7	1040	W8LIC	25	8	800
W2ESK	18	5	850	W8JWV	25	8	940
K2RLG	17	6	980	W8GFX	23	8	540
				W8NOB	21	8	975
W3RUE	30	8	975	W8LCY	21	7	610
W3GKP	29	8	1020	W8HLN	21	7	610
W3KCA	28	8	1110	K8AXU	19	6	750
W3TDF	28	8	915	W8GTK	18	7	550
W3SGA	26	7	700				
W3EPH	22	8	1000	W9KLR	41	9	1160
W3NKM	21	6	730	W9WOK	40	9	1150
W3LNA	20	7	720	W9GAB	33	9	1075
W3LZD	20	7	650	W9AAG	32	8	1050
				W9REB	31	8	850
W4HJQ	38	8	1150	W9ZIH	30	8	830
W4HHK	35	9	1280	W9LVC	27	8	950
W4ZXL	34	8	950	W9EQC	26	8	820
W4AO	30	8	1120	W9ZHL	25	8	700
W4MKJ	38	8	850	W9BPV	25	7	1030
W4UMF	28	8	1110	K9AQD	24	7	900
W4VLA	26	8	1000	W9PBP	23	8	820
W4EQM	25	8	1040	W9LFF	22	7	825
				W9KPS	22	7	690
W4WCH	24	8	850	W9PMN	19	6	800
W4JJC	23	6	725	W9ALU	18	7	800
K4EUS	23	6	765				
W4VVE	21	6	720	W9SMJ	29	9	1075
W4KZ	20	7	720	K9EMQ	29	7	1110
W4OLK	20	6	720	W9HID	27	7	890
W4AIB	19	7	840	W9BFB	27	8	1060
W4CPZ	18	6	650	W9GUD	25	7	1065
W4TLY	18	7	1000	W9RUF	23	7	900
W4RFR	18	7	820	W9INL	21	6	830
W4MID	17	6	750	W9UOP	21	7	900
K4YUX	16	8	830	W9TGC	21	7	875
W4LNG	15	6	1080	W9BYG	17	8	925
W4RMU	13	6	920	W9IFS	16	6	1100
				W9IC	12	6	1240
W5RCI	33	9	1215				
W5DFU	25	9	1350	VE3DIR	28	8	1100
W5LPG	25	7	1090	VE3AIB	26	8	910
W5AJG	23	8	1360	VE3BQN	19	7	790
W5KTD	22	8	1200	VE3AGG	17	7	800
W5JWL	21	7	1150	VE3DER	16	7	820
W5PZ	16	8	1300	VE3AOK	13	5	550
W5VKH	15	5	720	VE3BPB	14	6	715
W5ML	15	5	700	VE7FJ	2	1	365
W5PSC	12	5	1390				
W5HEZ	12	5	1250	KH6UK	1	2	2540

conditions will show whether or not there is a chance of 2-meter DX of the ionospheric sort. The clue is very short skip on 50 Mc. — something under 300 miles or so. Don't be fooled by very strong 6-meter signals from 1000 miles away. The best propagation on 6 occurs when the maximum usable frequency is only just a little above the band. If there is a possibility of sporadic-E skip on 2, signals on 6 may be strong, but they'll be close-in, and the DX opportunity, if any, on 2 will be at a much greater distance. There have been only a handful of ionospheric DX reports in all our experience on 144 Mc., but this is not to say that we shouldn't be on the lookout for them. With today's large arrays, high power, low-noise receivers and alert operating,

ionospheric DX on 144 Mc. is less of a long shot than we once thought it to be.

One more word to the 6-meter tyro — and the old-timer, too, if he's still with us. Sporadic-E skip is by no means so frequency-sensitive as F_2 . Marginal openings may just brush the low edge of the band at times, but more often than not there'll be just as good signals at 54 Mc. as at 50,004. Except for long-standing habit, there's almost no reason to hang out on the last ragged edge of the band during an E-layer opening. Move up to 52 Mc. or higher when things are hot. Remember, we used to work plenty of DX above 56 Mc. in the days prior to World War II.

Happy spring!

Here and There

DX activity on 6 slowed sharply in March, with north-south paths providing the few fireworks. KH1FS and PJ2AE were the principal sources of DX in Northeastern U. S. A., one or the other (or both) coming through 6 week ends in a row, through March 8. The southerly parts of the country caught more openings to South and Central America. Aruba and Nicaragua are among the rarer ones reported worked, along with Argentina, Chile and Peru.

W5SFW, Amarillo, Texas, worked PJ2AO March 1, while his antenna was only two feet off ground. Phil had moved to a new location, and was not expecting to work any DX that day! Other 50-Mc. men in the Amarillo area also worked several KP4s and PJ2AO.

Moving to above 51 Mc. and up has not prevented the 6-meter men of New Zealand from making contacts occasionally, though getting American 50-Mc. operators to look that high has been a problem. W6BJI, Fresno, Cal., worked ZL1BJ on 51.04 Mc. Feb. 26, for what is believed to be the first W — ZL QSO since the New Zealand stations were forced to move to the higher frequency. ZL1DE, ZL1BJ and ZL1AHQ were worked by various Fresno stations on March 1 and 4. There was F_2 to Florida for a short time March 1.

K6RNQ, Oakland, worked ZLs on March 1, 2, 12, and 14, including the above stations and ZL2DS. Bob says that the signals, including ZL1AHQ on 51.24 Mc., were surprisingly good, indicating that low-edge crowding is more often due to habit than necessity. Incidentally, ZL1BJ told Bob that ZL2AQ has a kilowatt and a large array on 144 Mc., and is open for moonbounce business.

KH6CTC, Kailua, Hawaii, says that openings to the Mainland disappeared after Feb. 23, but South America, Australia and New Zealand have been worked since. LU's were in during the afternoon of March 2 and 3. VK4NG and VK4HD were in well for half an hour beginning at 2100 HST March 6. VK9XK, Port Moresby, was worked at 2350 HST March 8, and VK4s HD and NG were worked again on the 12th, beginning at 2230. On the 13th the band opened at 2320, and KH6CTC worked VK4s NG ZAZ ZBE and ZAK, and several others were heard, up to 0045 HST. Esther says that VK4NG told her that they had been working JA's constantly and that he had just worked his 552nd Japanese station on 50 Mc.!

W3BJG/KH6 hit it on the nose when he fired up on 6 after several months of getting ready. His first night, March 15, he worked several locals, and then hit the late opening to VK4 and VK9. He will be on 144 Mc. soon also.

Here are some interesting prospects for the June V.H.F. Party. W8AZT, with the help of K8CLJ, W0CYT and possibly others of the Denver area, will be working on 50, 144, 220, and possibly 432 Mc. from Mt. Evans, one of the highest peaks of the Front Range, weather permitting. The road to the summit is not always open that early, but if Evans is not accessible the boys will be on some other very high spot. A high mountain expedition is being organized by W7BLE and W7NJB of Salt Lake City for the same period, and it is hoped that a station will be in business at Sandia Crest, New Mexico as well.

One country where DX should be good on 6, but which has been heard from very little, is India. W1HZ reports working VU2RM on 14 Mc., and relays the information that Rao is on 50 Mc. daily between 1300 and 1430 GMT, at the low end. His DX thus far includes VS6CJ and KR6AK.

Miscellaneous DX information from W5LFM, San Antonio, Texas: ZL1BE was heard Feb. 26 at 1700 CST by K5GEH. (Cal reminds us that W5VY worked all ZL call areas in April, 1958). March 1—HC1FS heard, along with back-scatter from W4RMU and W4ZXI, 0900 to 1000. March 4—K5GEH heard LU3EX on c.w. at 2000 CST, and worked HC1FS, as did K5HVC. March 18—LUs and XE1PA heard. K5HVC heard KH6UK, 1830 to 1845, and what sounded like JAs. March 19—K5HVC worked LU4DFN LU6DBE LU3DOH and heard HC1FS. K5GEH worked LU9MA and LU4DFN. This was a typical TE session at about 2000 CST.

March 22—Excellent TE, with HC1FS working about 10 stations in the San Antonio area. LU4DFN also very strong.

W5LFM remarks that "Local ragebrowsers and mobiles could help the interference problem by remembering that the band extends above 50.1 Mc.!" The Amateur's Code might well come into play here. You'll find it on Page 8 of any ARRL Handbook.

March Goes Out Like a Lion

Anticipating that auroras and ionospheric disturbances would be more frequent and violent with the waning phase of the solar cycle, we were looking for something good in March. It started the night of the 26th, and ran almost continuously for the next 50 hours or more. "Good" was not the word for it in lower-frequency circles, however. This was a real fade-out, the first in the experience of many newcomers to the game, and on Good Friday the ARRL lines were busy with "What's happened to 80?" calls.

On 50 and 144 Mc. it was a humdinger. Aurora contacts were made over some paths never before covered on 144 Mc. by the buzz method, and areas where auroras are frequent reported this one of the longest and best on record. W7JRG, Billings, Mont., worked W0IC, Denver, Colo., for his first 2-meter aurora QSO. This was at 2052 MST the 26th, and W0IC has a good signal for at least 1½ hours thereafter. W7JRG worked W7LHK, 200 miles over the mountains in Collins, Mont., via the aurora on 50 Mc. at 0854 on the 27th, and was still hearing his buzz signal at 1000 MST.

W0QDH, Salina, Kan., also worked W0IC by the north route, at 2051 CST on the 26th. At 2100 W0IC was the only signal audible at Salina, though many stations to the north and northeast had been heard earlier. At 2300 W0IC and W0RYG were both heard with a much purer note, but still peaking north.

At intervals the quality of the reflection must have been exceptionally good, for more than the ordinary number of voice contacts were made on 50 Mc. The several s.b. stations now using 50 Mc. in the northeast were doing very well most of the time, their no-carrier signals being far more readable than the a.m. boys.

The expected aftermath of South American DX broke Sunday morning, March 29, with HC1FS, Quito, Ecuador, working scores of stations all over the eastern half of the country, beginning about 0600 EST.

V.H.F. TVI Hints—W8NOH

Though v.h.f. TVI causes and cures have been covered for some years in the Handbook, some of the newer sets present problems in TVI elimination that may be somewhat different from those encountered in receivers produced when the Handbook information was compiled. The portable models, particularly, are giving v.h.f. men a bad time.

These sets are seldom used with anything but the built-in "rabbit-ear" antennas, and consequently they do not have as much signal input as the usual home installation with an outdoor array. Furthermore, most portables and other low-priced receivers are now built without transformer power supplies. They use various types of rectifiers and voltage-doubling circuits, and work directly from the a.c. line. These not only may pick up interfering signal energy on the a.c. line, but their cases or chassis cannot be grounded without creating an electrical hazard. The interference problems in these sets are more like the old a.c.-d.c. receiver BCI than the more common forms of TVI, and the cures are similar to those prescribed for BCI years ago.

W8NOH advises that the first step should be to check with an approved filter. This may eliminate picture interference, which usually comes in on the antenna, but it may not stop audio trouble, which is often picked up by the audio circuits of the receiver, or occasionally conducted into the

set on the a.c. line. If the audio interference persists with a filter installed, or with the antenna disconnected, try a 200- μ f. ceramic capacitor across the audio volume control. In stubborn cases, insert a 10,000-ohm carbon resistor in series with the grid of the first audio tube, right at the socket. Bypassing the grid with a 200- μ f. capacitor may help.

In sets having power transformers try bypassing the a.c. line to the chassis. Special dual capacitors are available for this purpose. Disk ceramics of the type commonly used for d.c. bypassing are not recommended for a.c. line use. In hot-chassis sets try a capacitor directly across the a.c. line. Capacitor values around .001 or .002 are recommended. R.f. chokes inserted in the line may help, or traps tuned to the operating frequency may be more effective.

Receivers with plastic or wood cabinets are often wide open to pick up of r.f. energy. Putting foil or screening in the bottom of the cabinet and bonding it to the chassis is often helpful with these. Some sets do not have tube shields. On these a shield over the audio tube may solve the problem. Watch out for possible shorts in sets having printed circuitry when shields are tried. Aluminum foil cemented to the inside of the case, and bonded to the chassis, may be required. If you have a portable of your own, experiment with it until you have cleaned up all interference. This treated receiver can then be used effectively to demonstrate that the transmitter is not at fault. Do not work on the complainant's receiver. That's a job for the serviceman, but you can show him what to do.

A problem that may be corrected by adjustment of the receiver is a tendency to shift during modulation or keying of the transmitter. This is due to the effect on the a.g.c. system of the surge of r.f. Where the a.g.c. resistor is a fixed value, try a lower value. Where an a.g.c. control is included, readjustment of it may correct the trouble. Sometimes a large electrolytic capacitor connected to the a.g.c. point will help, but be sure to check for side effects on the contrast or receiver sensitivity. In adjusting the a.g.c. control, go only as far as is necessary to clear the trouble.

Remember that there are almost as many kinds of TVI as there are makes and models of TV sets. Just because your own set is clear is no proof that your neighbors' sets will be. By locating the troubles when they develop, and then doing your best to see that the interference is corrected, you'll make friends instead of enemies. And that's half the battle, at least!

220- and 420-Mc. STANDINGS

220 Mc.				
W1FOS	16	450	K6CTG	2 2 240
W1HDQ	11 5	450	W6MMU	2 2 225
W1RFU	11 5	480	W8LPD	6 4 480
W1OOP	7		W8PT	4 4
W1CBE	10		W8SVL	6 4 520
W2AOC	13 5	450	W8WRN	4 4
K2CBA	8 3	315	W9EQC	7 4 740
W2DWJ	13 6	740	W9JF	6 4
W2DZA	8 4	410	W9TED	4 4 605
W3UJG	8 5	300	VE3AIR	5 3 350
W4UMF	11 5	420		
420 Mc.				
W1FOS	7		W2DZA	5 3 130
W1HDQ	8 2	210	W2DWJ	6
W1RFU	8 4	410	W4VVE	6 4 410
W1OOP	7		W9GAB	5 3 355
W2BLV	11 5	360		

With the Clubs and Nets

The boom in v.h.f. interest has brought many new clubs and nets into being. Because such groups are highly effective in promoting the good of all, we are happy to devote QST space to a record of their doings, past and planned. Here is the latest in club and net news.

The Mt. Airy V.H.F. Club of the Philadelphia area is holding its 4th Annual Hamfest and Picnic Aug. 9, at Ft. Washington State Park, Flourtown, Pa. Registration is \$1.00, payable at the park. Games, prizes and free soda for all the family. More information from W3SAO, 829 W. Fishers Ave., Phila. 41, Pa. Rain date: Aug. 16.

The Windsor Central School Radio Club, WA2DNW, Windsor, N. Y., is running code practice sessions on 50.178 Mc. each Saturday, 2000 to 2030 EST. Speed begins at 5 w.p.m., increasing one word each week until 13 w.p.m. is

(Continued on page 188)

DXpedition to Juan Fernandez Islands

January and February, 1959

BY LUIS M. DESMARAS,* CE3AG

JUAN Fernandez Archipelago is a group of three islands — Más a Tierra and Santa Clara are about 400 miles west of the Chilean coast, while Más Afuera is about 500 miles from the mainland. Only Más a Tierra (commonly called Juan Fernandez Island) has any inhabitants. The principal occupation of these people is lobster fishing, with there also being some agriculture and raising of cattle. Those of you who are up on your history will perhaps recall that it was on this island that the Scottish sailor Alexander Selkirk was left in 1704, and where he lived for five years with only a goat as a companion. His adventure gave rise to the famous Defoe novel *Robinson Crusoe*.

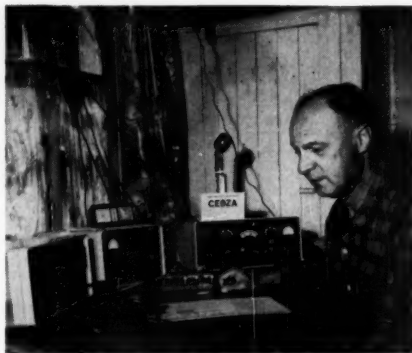
There is little amateur activity on Juan Fernandez. For several years there has been only one active amateur there, CE0ZF (ex-CE2BM), who cannot do much operating because of the lack of electric power. Electricity is available only for about four hours each evening.

Four members of the Radio Club de Chile — CE3AG, CE3HL, CE3GI and CE3QG — decided to carefully plan a DXpedition to Juan Fernandez, and schedule it for our summer vacation. I was able to get quick delivery from the Collins Radio Co. of a 32S-1 and 75S-1 to operate on s.s.b. and c.w., while CE3GI supplied a 32V-1, CE3HL a 75A-1, and CE3QG provided equipment for the 50-Mc. band. I also supplied a 500-watt gas-electric plant (the same one used on the CE0AA Easter Island DXpedition of 1953), while CE3CI lent us a 2-kw. job.



The phone operators of the DXpedition. From left to right: CE0ZB (CE3HL), CE0ZD (CE3QG), and CE0ZC (CE3GI), with the Collins a.m. gear.

* P.O. Box 761, Santiago, Chile.



CE0ZA (CE3AG) with the Collins "S" line gear that he used on c.w. and sideband.

The antennas were simply those old reliable half-wave dipoles with 52-ohm coax feedline, duplicated for each of the two stations. That is, we had two sets of dipoles for the 14-, 21-, and 28-Mc. bands.

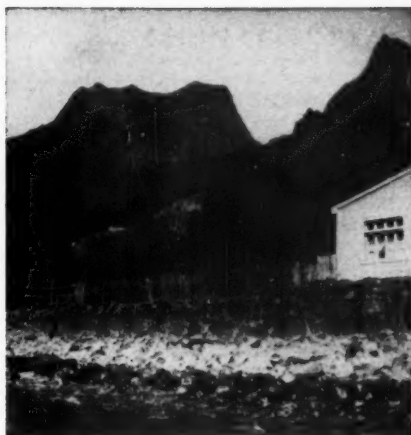
After much planning, false starts, delays and other difficulties, we sailed off on the *Aka Pinto* transport of the Chilean Navy on January 22. This naval ship makes an annual voyage to Easter Island, sailing from Valparaiso each January and requiring 28 days for the round trip.

We reached Juan Fernandez early on January 24, and by noon we had all our equipment safe and sound on the beach. We were affectionately received by Sergio, CE0ZF, who put at our disposal a beautiful house to serve as our operating headquarters and living accommodations. During lunch (lobster, of course) a great storm of rain and wind descended on the island. Our spirits began to sink, for we still had to install antennas, the electric plants, and so on, and the thought of doing it during all that wind and rain wasn't very cheerful. Fortunately the weather improved by mid-afternoon, and we got to work. We could only get the antennas about 24 feet off the ground, but even so the results were excellent.

That evening we called the first CQ from CE0ZA on 14,030 kc., and were answered with an awful pile up. W2ADP was the first QSO, at 2354 GMT (1954 local time), followed by W9QNO, W2CTN, W6GMF, K4HNA, and another 40 Ws until G6YQ broke the string!

In the meantime, CE0ZB, CE0ZC and CE0ZD, taking turns of one hour each (settled by casting lots), worked on a.m. with the 32V-1 and 75A-1 on 10 and 15 meters.

In brief, our 23-day activity on Juan Fernandez



At the right is the CEØZA "shack" and at the left can be seen the antenna mast. That mountain in the background is nearly 3000 feet high.

produced 5657 QSOs, broken down as follows:

CEØZA (CE3AG)	3501 QSOs (3201 c.w., 300 s.s.b)
CEØZB (CE3HL)	742 QSOs (all a.m.)
CEØZC (CE3GI)	754 QSOs (all a.m.)
CEØZD (CE3QG)	660 QSOs (all a.m.)
	30 QSOs (6 meters)

CEØZA worked 84 different countries, while CEØZB worked 70, CEØZC 66, and CEØZD worked 68. The number of different countries worked by all four stations was 120.

We had decided from the very beginning not to operate on 3.5 and 7 Mc., because in this area conditions on those bands are generally poor. QRN is heavy, and there is much interference from South American a.m., impossible to avoid.

We came back from our DXpedition happy — everything worked out as we had planned. We are grateful to the Chilean Navy for their furnishing of transportation, and to CEØZF and his wife for their thoughtful hospitality during our stay. We also appreciate the many cards and letters we have received commenting on the caliber of the operation from our four CEØZ stations — we cannot thank each person individually, so please let this serve instead.

Cards were printed before the trip, many QSLs were delivered by CE3DG before the end of the DXpedition, and all QSLs received by us will be promptly answered.

QST

[Editor's Note: CE3AG arrived home the day before the annual ARRL DX contest on c.w., and although he was tired from the long trip, took part in the contest to the tune of 871 QSOs. These, added to the 3501 made as CEØZA, made a total of 4372 QSOs by Luis in 29 calendar days. We don't know whether this is any sort of a record in DX history, but it *does* seem to be a pretty fair performance!]

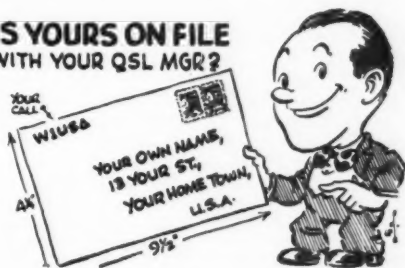
ARRL QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K and VE call area. All you have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4½ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

- W1, K1 — G. L. DeGrenier, W1GKK, 109 Gallup St., North Adams, Mass.
- W2, K2 — North Jersey DX Association, Box 55, Arlington, New Jersey.
- W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.
- W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
- W5, K5 — Brad A. Beard, W5ADZ, P.O. Box 25172, Houston 5, Texas.
- W6, K6 — Horace R. Greer, W6TI, 414 Fairmount Avenue, Oakland, Calif.
- W7, K7 — Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.
- W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.
- W9, K9 — J. F. Oberg, W9DSO, 2601 Gordon Drive, Flossmoor, Ill.
- W0, K0 — Alva A. Smith, W0DMA, 238 East Main St., Caledonia, Minn.

- VE1 — L. J. Fader, VE1FQ, P.O. Box 663, Halifax, N. S.
- VE2 — George C. Goode, VE2YA, 188 Lakeview Ave., Point Claire, Montreal 33, Que.
- VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, Ont.
- VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.
- VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
- VE6 — W. R. Savage, VE6EO, 833 10th St., North Lethbridge, Atla.
- VE7 — H. R. Hough, VE7HR, 1684 Freeman Rd., Victoria, B. C.
- VO1 — Ernest Ash, VO1AA, P.O. Box 8, St. John's, Newf.
- VO2 — Douglas B. Ritcey, Dept. of Transport, Goose Bay, Labrador.
- KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.
- KH6 — Andy H. Fuchikami, KH6BA, 2543 Namanu Dr., Honolulu, T. H.
- KL7 — KL7CP, 310-10th Ave., Anchorage, Alaska.
- KZ5 — Catherine Howe, KZ5KA, Box 407, Balboa, C. Z.

IS YOURS ON FILE WITH YOUR QSL MGR?



The Amateur and Public Relations

BY HAROLD R. RICHMAN,* W4CIZ

This is the transcript of a speech originally presented before the Rock Creek Amateur Radio Association in Bethesda, Maryland, on January 9 of this year. It was later reprinted in Auto-Call, the monthly publication of the Washington Mobile Radio Club. W4CIZ is employed by the FCC in its Field Engineering & Monitoring Division, and is Advisor to the Washington TVI Committee (WTVIC). It's recommended reading for everyone who needs a refresher on how to handle the public when TVI rears its ugly head.

THE TVI picture is brighter today than at any time in the past, but we must not stop now until we've reached an orbit which will allow unimpeded operations on all amateur frequencies. Let us review the present status of the TVI reduction program generally, before embarking on our topic "The Amateur and Public Relations."

Technical advances in the past few years, equipmentwise, contributed by amateur and industry, have been numerous. Though much more remains to be done, a long-range and intensive educational program recently initiated and widely developed by the Electronics Industries Association for the television service technician assures the support of an informed TV service industry. Three of your WTVIC TVI Aids appear as a part of an EIA Technicians Training Course in its manual titled *Advanced Television Servicing Techniques*.

You are all familiar with recent circuit changes and the addition of preventative rejection circuits by the manufacturers in most all of the newer television receivers. The few manufacturers who do not now incorporate high-pass filters as a part of their receivers readily provide filter and installation, when needed, at no cost to the set owner. So much for progress on the part of industry.

Partly as a result of generous technical assistance and support from your TVI committee, the majority of amateurs now operate with transmitter and transmission system virtually loaded down with devices for the prevention of TVI. For example, K3AKK reports that he can operate 1 kw. and at the same time monitor his own television receiver with its antenna mounted on the same tower as the transmitting antenna.

In another instance W3IU, with 1 kw. on all bands up to 50 Mc., reports that seven television receivers of different makes—two of them

monitors—can be used interference-free in his own home while he transmits. These are *not* isolated cases.

Here is further evidence of success on the licensee front. Most all 2- and 6-meter TVI complaints are cleaned up by installation of a properly tuned quarter-wave stub at the antenna input terminals of the television receiver. Some television receivers, where the amateur operates on 6 meters, may require, additionally, installation of a high-pass filter with a 52-Mc. cutoff. 21-Mc. i.f. cases are almost always solved with the installation of a specially designed high-pass filter with cutoff around 21 Mc., in addition to the general purpose filter. Color TVI complaints in most instances appear to be due to audio rectification conditions. The cure generally requires a suitable high-pass filter at the tuner of the receiver. If the interfering signal is picked up directly by the receiver's audio section, the only cure is the connection of a simple RC filter in the grid circuit of the first audio tube. All manufacturers of color TV receivers are cooperating fully in handling these problems when they arise.

We have covered, briefly, technical advances on the part of industry, and the radio amateur. Now for the third, most difficult, phase of our topic associated with the solution to TVI, Good Neighbor Relations.

My suggestions for peaceful co-existence follow.

Adhere conscientiously to a *Civil* Defense, where necessary, and a Sympathetic and Helpful attitude when acknowledging reports of BCI, TVI, or HiFi! from your neighbor. Use the same strategy of self control and discipline as the case is processed. Of what value is technical knowledge if you cannot put this across to the irate television set owner who complains of TVI. The control of TVI appears to be 75 per cent related to the practice of a "Golden Rule" philosophy by the radio amateur involved, and, remember, first impressions stick. If you start off on the wrong foot, you will find it extremely difficult to get back in step again on friendly terms with your neighbor.

Prompt, sympathetic attention, or courteous acknowledgement of the complaint you receive most always smooths the way for mutual understanding and ultimately brings about an agreeable adjustment for BCI or TVI effects. If you try hard enough you might convert the complainant into the ranks of amateur radio. Several active Washington amateurs are among those who were on the other side of the fence before "joining up." Now they have TVI problems of their own from time to time.

Keep in mind that, though the WTVIC takes the sting from the initial TVI cases you develop,

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* 1110 Lake Boulevard, Annandale, Virginia.

Nuvistor — Something New in Tube Construction

OVER the years there have been many innovations in vacuum-tube construction — the metal envelope in its day, for example, and the disk-seal technique now widely used in transmitting tubes — but garden-variety receiving tubes have retained certain basic features from the beginning. Typical of these are the use of glass for stems and seals and of mica washers for element supports. We may now be seeing the beginning of another era in receiving-tube construction if the optimism expressed by RCA for its projected "Nuvistor" line of tubes is borne out by future trends.

The Nuvistor construction is the result of several years' study and development in the effort to improve performance and reliability while reducing size and power requirements. Although it is not expected that tubes will be manufactured for quantity sale before next year, samples of a few types — a small triode and tetrode, and a beam power tube — will soon be available to equipment designers. Nuvistor-type tubes are well adapted to mechanized production, and it is expected that they will be competitive in price with ordinary tubes of corresponding characteristics.

Only two kinds of material are used in the Nuvistor — ceramic and metal. The distinguishing constructional features are shown in the cut-away view, Fig. 1, of a developmental triode. The elements are cylindrical, terminating at the bottom in a cone-shaped structure supported on three pillars of wire (only two of which are shown in each case in the picture). These are concentrically mounted on a ceramic disk through which the connection pins project. The whole assembly is covered by a metal envelope in the case of the triode; in the tetrode, a metal top cap is the plate connection. Fig. 2 shows three Nuvistor types in comparison with their conventional counterparts. Advantages claimed for this type of construction are the ability to hold close dimensional tolerances, extreme ruggedness, and ability to stand high temperatures —

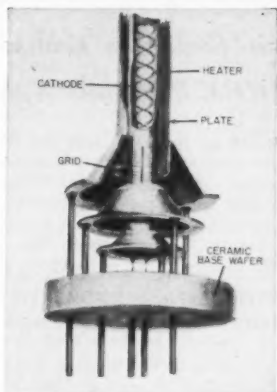


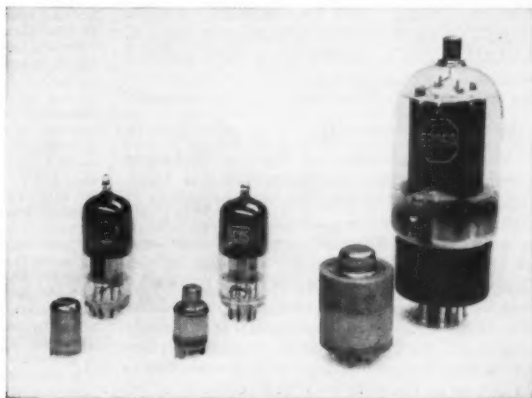
Fig. 1—"Nuvistor" construction uses concentric electrodes supported at the bottom by pillars brazed to cones. The tube illustrated is a developmental triode.

the last because of the elimination of glass and mica.

The close interelectrode spacing that results from "scaling down" the tube dimensions allows the tubes to operate at comparatively low plate and screen voltages. The triode, for example, has a transconductance of over 10,000 micromhos and will operate well with as little as 40 volts on the plate. The design objective in the beam tetrode is operation at a plate current of 200 ma. with only 65 volts on the plate and screen! Cathode power is smaller, too. New socket designs will be called for, of course.

These tubes, which are comparable in size with transistors of equivalent power ratings, should help keep the vacuum tube competitive with transistors in miniaturization of equipment, and offer the circuit designer those characteristics which are peculiarly the assets of vacuum tubes as compared with semiconductors. — G. G. QST—

Fig. 2—Three developmental types of "Nuvistor" tubes with their corresponding current types. Left to right, a small triode, a tetrode r.f. amplifier, and a beam power tube.



Happenings of the Month

League Endorses Technicians on 2 Meters

ARRL Petitions Again for C.W. Segments on V.H.F.

Responsive to the FCC proposal in Docket 12728, the League's Executive Committee conducted a mail vote of the Board of Directors with the result that ARRL policy has been established supporting the proposal to permit Technicians to use the 144-Mc. amateur band. The pertinent text of the League's filing follows:

PETITION FOR RECONSIDERATION
COMMENT OF THE AMERICAN RADIO
RELAY LEAGUE, INC.

Pursuant to paragraph 9 of the notice of proposed rule-making in Docket 12728, The American Radio Relay League, Inc., files these comments on behalf of some 70,000 FCC-licensed amateurs who are members of the League.

The League supports the proposal to permit operating privileges for Technician Class amateur operators in the 144-148 Mc. amateur band. We agree with the Commission's conclusion that several of the pertinent considerations have undergone changes in the four years since a similar proposal was dismissed, largely at our request. The League feels that, in general terms, the arguments set forth are valid and meritorious.

IOWA LICENSE PLATES

The old if-you-don't-succeed adage well describes the spirit of Iowa amateurs in their attempts to obtain call-letter license plates. Unsuccessful in several tries since 1951, last year a special statewide committee was formed, with headquarters at the Council Bluffs Radio Operators Club and a representative from nearly every active club in the state. A well-organized campaign was crowned with success in February, when Governor Loveless affixed his signature to the bill providing that amateur call plates will be available the first of next year for an additional fee of \$2. The Governor, in an announcement transmitted from K0CVT, complimented Iowa hams on their instant preparedness and fine work during disasters. Members of the committee include K0CYP, W0AWX, K0ENN, K0LPJ, K0BLJ, W0YUA, W0KJN, K0ISA, W0MG, W0AFN, W0RVT, W0GQ, W0BQC/0, K0AAG, W0AUL, and K0MMS. Iowa makes it 44 states out of 49, and now every state west of the Mississippi is in the successful LP category!

C.W. BANDS ON V.H.F.

As most readers will recall, last year the League petitioned the Federal Communications Commission to establish exclusive c.w. segments of 100 kc. each at the low ends of the 6- and 2-meter amateur bands. After rule-making proceedings, FCC decided to grant such c.w. segments but located them at surprisingly different spots than had been requested. Responsive to requests by the League, and individual amateurs similarly concerned, the Commission postponed the effective date of its order and granted an extension to March 10 of the date by which petitions for re-

opening or reconsideration might be filed. We publish below the text of the League's petition which requests the Commission to establish the c.w. segments at the low ends of the bands.

FEDERAL COMMUNICATIONS COMMISSION

In the matter of

Amendment of Section 12.111 of
the Commission's Rules, Amateur
Radio Service, to provide that only
A1 emission may be used in the
lower 100 kc. of the 50 and 144 mc.
amateur band

Docket 12485

The Commission will recall that in its notice of proposed rule-making issued June 11, 1958, its proposals were for exclusive c.w. assignments at 50.0-50.1 and 144.0-144.1 Mc. These frequencies are identical with those requested by the American Radio Relay League, Inc., in its petition dated May 21, 1958, which led to the initiation of the present docket. Until publication of the report and order of December 3, 1958, there was no indication that the Commission was contemplating any change in its proposal of June 11. During the period available for comment, therefore, the League had no reason to believe that further discussion of the frequency assignments proposed by it was either necessary or desirable.

We believe the Commission's action of December 3 is based on conclusions that, because of errors of fact in its findings in these proceedings, are not justified. These errors appear to have arisen because of incomplete information, or because certain of the comments from opponents of the proposal have created erroneous impressions. Specifically, we believe the findings numbered (6) and (11) in Section 5 of the report and order are incorrect in their references to the 50-54 Mc. band. The conclusions in Section 6 with respect to the assignment of exclusive c.w. frequencies are based principally upon these two findings.

Concerning Finding (6), Section 5: A 100-kc. exclusive c.w. segment in a band having a width of 4000 kc. represents one-fortieth or 2.5 percent of the total band. While it is literally true that those amateurs who customarily use A3 operation in the 50.0-50.1 segment would be forced to go "higher in the band," a move of the order of 100 kc. should have no significant bearing on interference to television reception, a result suggested in (7), Section 5. Such interference is confined to regions in which Channel 2 television signals are usable; in other regions the interference is not primarily a function of the part of the 50-54 Mc. band that is used for transmission. Even in Channel 2 service areas there is little difference in respect to television interference between, for example, frequencies of 50.0 and 50.5 Mc.

Television interference aside, it would seem to be self-evident that a 2.5 percent decrease in the space available in the band for A3 transmission does not constitute a serious hardship; no operator is denied the use of the 100 kc. segment, but is merely restricted in the type of emission he may use.

Concerning Finding (11), Section 5: It is true that certain types of propagation are not significantly frequency-sensitive within the range covered by either the 50-54 or 144-148 Mc. bands. Tropospheric scatter, meteor-burst propagation, and auroral propagation are examples of such types. In general, propagation having such characteristics is prevalent on both 50-54 and 144-148 Mc.

However, a primary objective in asking for the exclusive c.w. assignment at 50.0-50.1 Mc. was to facilitate amateur investigation of propagation phenomena that have been

demonstrated to be exceedingly frequency-sensitive in the 50 Mc. band. Two such types are regular F_2 -layer ionospheric transmission, and anomalous ionospheric propagation usually involving regular F_2 propagation over some part of the path.

(a) *Regular F_2 layer propagation.* It is well known that this type of transmission exhibits a sharp cut-off frequency, and that even during periods of exceptionally high sunspot activity the limiting frequency is only occasionally as high as 50 Mc. During the current sunspot maximum and the last preceding one, in both of which the sunspot numbers reached higher values than in previously recorded history, amateur observations have shown that only rarely has the maximum usable frequency (m.u.f.) penetrated to the 51-52 Mc. region.

Quantitative data on the frequency dependence of regular F_2 layer propagation are given in a recent National Bureau of Standards Report.¹ It is shown therein that during a sunspot maximum the m.u.f. can be expected to be above 45 Mc. for only one percent of the time in the latitudes of the United States, but that it can be expected to be above 41 Mc. in the same latitudes for 10 percent of the time. Thus, the probability decreases by a factor of 10 in 4 megacycles — in a frequency region, it will be observed, that is at least 5 megacycles removed from the low frequency edge of the 50 Mc. band. If the same rate of decrease were to hold for the spectrum between 45 and 54 mc, the probability that the m.u.f. would rise to a usable value in the 50-54 Mc. band, small at best, would be at least twice as great at 50 Mc. as at 51 Mc. Actually, 50 Mc. is in the region of the absolute peak of maximum usable frequencies, so the odds against the band's being "open" at 51 Mc. when it is "open" at 50 Mc. are, as shown by experience, very much greater.

The current sunspot cycle peak has provided striking evidence of this frequency dependence. A propagation path of major scientific and amateur interest is that between the United States and Japan, both because of its nature and because several hundred Japanese amateurs are active in the 50 Mc. band, thus providing excellent opportunities for observations. By agreement among themselves, Japanese amateurs reserve frequencies between 50.0 and 50.5 Mc. for long-distance work and use frequencies above 50.5 Mc. for local communication. Hence, contacts between United States and Japanese amateurs have been made principally between 50.0 and 50.5 Mc. Also, as an International Geophysical Year effort a "beacon" station has been operated continuously on 50.504 Mc., beginning November 1, 1958, by the Japanese Amateur Radio League. The following tabulation shows the results of reception of Japanese signals by United States amateurs during the month of November, by United States call areas:

Day (Nov.)	CALL AREA									
	W1	W2	W3	W4	W5	W6	W7	W8	W9	W0
4							XX			
5					X	X	X			
6							X	X	X	
7							X	X		X
8						X	X	X	X	X
9							X			
10							X			
11					X	X	X		X	
12				X	X	XX	XX	X	X	
13					X	XX	XX		X	
14						X				
15						X	X		X	
16				X	XX	XX	XX		X	
17						X				
18					X	XX	XX	X		
19					X	X				
20		X				X		X	X	
21					X	XX	XX	X		
22					X	X	XX	X		
23		X	X	X	X	X		X	X	
24				X	XX	X		X		
25			X	X	XX	X			X	
26				X	X	XX			X	
27			X		XX	X		X	X	
28				X	X					
29					X	X			X	
30					XX	X		X	X	

X — Japanese amateur stations heard.
XX — Beacon station JAIIGY also heard.

These data are from reports of amateurs participating in the ARRL Propagation Research Project (IGY), a group that has been making observations of 50 Mc. propagation with a high degree of regularity. Although Japanese amateur signals were heard in the 7th call area on every November day after the 3rd, only on eight of these days was the continuously-operating beacon signal on 50.504 Mc. heard. The path from Japan to the 7th call area is the most favorable one, in point of distance, of any between Japan and the United States. In the 6th call area, the next most favorable path, Japanese signals were heard on 18 of these days, but JAIIGY was heard only on five of them. This station was not heard at all in other call areas, despite numerous instances of reception of Japanese amateur stations in all call areas except the 1st and 2nd. All the information available indicates that the more difficult the path, as in the 3rd and 4th call areas, the more essential it became for the frequency to be as close as possible to 50.0 Mc. Also, the observers' reports show clearly that on those days when JAIIGY could be heard, its signal was audible for only a small percentage of the time during which Japanese amateur stations working near the 50.0 Mc. edge of the band were heard; typically, in the 6th call area the beacon signal could be heard for only about ten minutes in a three-hour period during which the band was "open" for lower-frequency Japanese signals.

Regular F_2 layer propagation at or just below the m.u.f. offers the principal means by which contact can be established with amateur stations in foreign countries. As shown here, such propagation is far more favorable at the low frequency edge of the band, so most foreign stations work close to 50.0 Mc. An exclusive c.w. assignment in the United States at 50.0-50.1 Mc. favors the successful achievement of such communication by eliminating local interference from United States amateur phone stations, which can be highly destructive of long-distance reception. An exclusive c.w. assignment at 50.9-51.0 Mc. would be of little or no value for this purpose since few, if any, foreign amateur stations operate on frequencies as high as 51 Mc. when attempting to contact United States stations.

(b) *Anomalous ionospheric propagation.* The most interesting propagation phenomena, from the point of view of investigation and discovery, are those which, while usually including regular F_2 propagation over some part of the path, involve additional modes that may not be completely identified or understood. Unlike regular F_2 layer transmission, signals arriving by such propagation modes are always weak, often being detectable only with the best possible receiving equipment and high-gain antennas. Communication usually is possible only with A1 transmission.

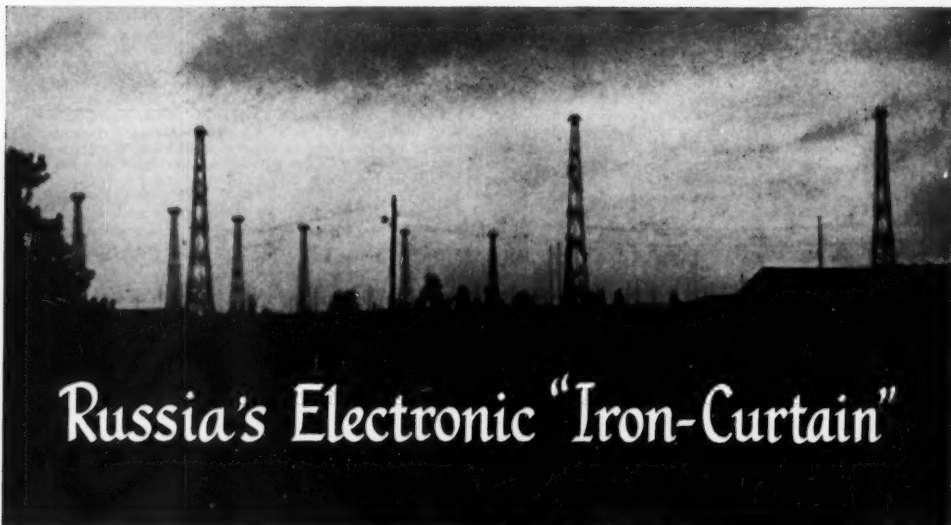
A typical example is the weak scatter-like signal that can be received over long distances at frequencies just above the actual F_2 maximum usable frequency for the path. Because of the relationship it bears to regular F_2 layer propagation, it is equally frequency-sensitive. At times when the m.u.f. for regular F_2 layer propagation is just below 50 Mc., this propagation mode is usable at 50.0 Mc. and just slightly higher. This condition occurs at the beginning and ending of every F_2 opening, and often is responsible for extending by a considerable factor the period during which communication is possible. Its duration is greatest at the lowest available frequency.

Another type of propagation that has considerable experimental interest is the well-known "back scatter", which frequently makes communication possible between two stations within the skip zone or between which there is no direct propagation path available. This is also a weak-signal type of communication and, like other forms of propagation involving regular F_2 layer effects at some point in the path, exhibits the same frequency dependence that has been discussed in this section.

Concerning Equipment Requirements and Characteristics: Not mentioned in the Commission's findings and conclusions, but nevertheless of great practical importance, are the characteristics of equipment necessary for the type of work for which the exclusive c.w. assignments were requested. We emphasize, again, that the paramount consideration in requesting these assignments was that of making communication possible with extremely weak signals; c.w. is used because it is the only practicable mode of communication,

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¹ NBS Report 6020; R. C. Kirby, "1958 Critique of VHF Ionospheric Scatter Propagation."



Russia's Electronic "Iron-Curtain"

A Russian sky-wave jamming center (?). The above photograph, an enlargement of one frame of a movie film, was made by an American tourist. It shows a portion of a very large installation some 10 miles outside the residential area of Moscow, U.S.S.R., which is presumed—on the basis of its resemblance to installations elsewhere—to be a sky-wave jamming center. The photographer estimates that at this particular site there were no less than seventy or eighty lattice towers of the type shown. (Photograph courtesy of Newsweek.)

W6QYT recently had the opportunity to visit the Munich relay base of the Voice of America. Opinions concerning the ethics of jamming may vary (the author has expressed some of his own in this article) but its existence is an inescapable fact, and we think this account of how it operates is not only interesting in itself but will help explain those weird noises that plague the ham bands.

Some Impressions of the Struggle Between Broadcasters and Jammers in Europe

BY O. G. VILLARD, JR.,* W6QYT

SHORT-WAVE broadcasts, in the opinion of many amateurs, are occasionally useful as band-edge markers or as indicators of exceptional band conditions, but some broadcasts represent nuisances which, by a vagary of international law, keep turning up in lower-frequency ham bands where they add immeasurably to the general QRM and confusion. The story behind much international broadcasting at the present time, however, turns out to be a fascinating one, and it was a real eye-opener for the writer to have had an opportunity to learn something of the situation during a brief trip to Europe recently. Unfortunately, the present and probable future growth of short-wave broadcasting makes the future of some of the lower-frequency amateur bands look rather bleak, especially when the coming sunspot minimum is taken into account.

The situation, in a nutshell, is this. Far from being a nuisance, short-wave broadcasting is

regarded as a major facet of the ideological struggle between the so-called "Free World" and what have been designated as the "Iron Curtain" countries. The scale of the effort, which involves broadcasting from one side, and broadcasting plus jamming from the other, has been steadily increasing. When the next sunspot minimum arrives, and the number of usable channels shrinks, the demand for spectrum space will be such that broadcasters and jammers will either have to reduce their effort or operate outside their existing assignments in new territory. The latter alternative seems by far the more likely. And where does the path of least resistance into new territory lead? Directly toward the amateurs bands, alas.

An Example of Jamming in Action

Almost everyone in the United States is aware

* Stanford University, Stanford, Calif.

of the jamming that is going on in the short-wave bands. But to gain a proper feel for the scope and intensity of this struggle to be heard and to prevent hearing, there is no substitute for a trip to Central Europe. Let's say we are in Munich, at the Hotel Platzl, just across the street from the famous Hofbrauhaus, where Hitler got his start. We have an all-wave receiver and let's see what we hear. To anyone familiar with medium-wave broadcasting on the Continent before the war, the number of U. S. voices which are now audible represents a striking change. Not too long ago, the only spoken English on the radio dial was of British origin. Those who were in Europe during the war will be interested to know that Uncle Sam is even today very much in evidence. At the low end of the broadcast band, for example, we find rock-and-roll and other U. S. entertainment broadcast by a 100-kilowatt station of the Armed Forces Network. Higher up the dial, the U. S. Information Agency's Berlin RIAS station can sometimes be heard with U. S. programs, and two more AFN stations are heard at 872 and 1106 kilocycles. Finally, at 1196 kilocycles is the very powerful Voice of America relay station at Munich. To a visitor from the U. S. A., these home-town accents sound familiar and reassuring, sandwiched as they are between voices speaking in all languages from Albanian through Ukrainian.

Now we in the U. S. A. are proud of our way of life, and want the rest of the world to know about it. To that end our taxes support a Voice of America, which broadcasts daily in 37 languages some 96 programs through a network of 85 transmitters, to all parts of the world.¹ Because the auroral zone shields much of Europe and Asia from much of the U. S. A., and because of the distances involved, the VOA makes extensive use of foreign relay bases, of which there are a total of nine. These bases pick up short-wave broadcasts from the U. S. and retransmit them on short, medium and sometimes even long waves. They have between them no less than 55 transmitters. Since the U. S. is especially in-

terested in having its point of view known in Russia and in the satellite nations, the VOA has an important relay base at Munich, in addition to ones in Greece, Morocco, Ceylon and the United Kingdom.

The medium-wave VOA transmitter at Munich has an output power of 300 kilowatts and is located 10 miles northeast of the city. When broadcasting toward Poland and Russia, it uses a directional antenna having a lobe toward Moscow; Munich lies in a null. From our hotel room we have been listening to an English language program from this monster for several minutes now; here comes the station break. A girl announcer reminds us that we are hearing the Voice of America from Washington, and states that the next program will be Russian. Hello, what's this — sounds like an old-fashioned regenerative receiver tuning up in the background. There ought to be a law against one-tube bloopers like that, nowadays. The program begins: "Govorit BRROUGHRR ZZZMMEESEGRREEZZGR . . ." The "blooper" was a jammer zeroing in: a jammer of such strength as to drown out the VOA program completely in the city of Munich itself.

Matters can't be so bad, perhaps, on the short waves. After all, maybe that null was exceptionally deep. Ah — here is a program in the 9-megacycle band being relayed by Tangier. Africa isn't very far away — an easy single-hop path. We hear the identifying strains of "Columbia, the Gem of the Ocean." The announcer says that this is the Voice of America transmitter in Tangier, and that the next program will be in Latvian. Maybe this one will slip through; perhaps Latvian is not so important as Russian. The program begins. Was that a whistle in the background? Oh, oh — here comes something. Yes, a jammer, but the program is still clearly audible. Looks as though it may get through anyway. Say — is that *one* jammer or *two*? Yes, there is a second jammer — it has a distinctly different sound. Pretty hard to hear the program now, but by straining hard the broadcast can be still distinguished. Ow! — what was that? Not *another* jammer? The racket on the frequency now sounds like a buzz saw going through a knot, and of the broadcast there is no longer any trace. Fig. 1 shows an

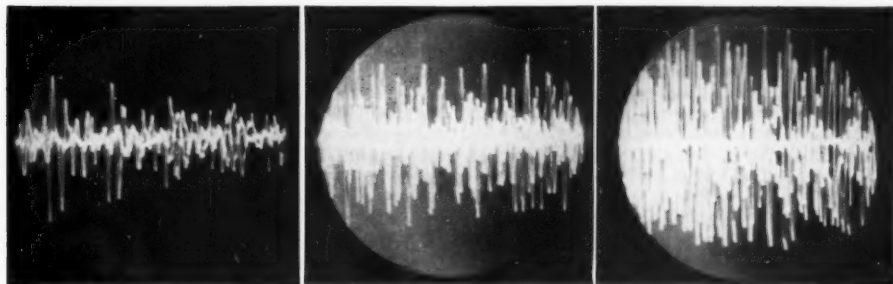


Fig. 1 — Going, going, gone: an oscilloscopic view of the effect of jamming on a VOA program broadcast from the Tangier relay base and received in Switzerland. (A) Shows initial voice signal; (B) Signal shortly after jamming began and (C) Signal after jamming had built up to full intensity. Frequency band: 21 megacycles. Jammer call letters: "WM". Recorded at Zermatt, Switzerland, approximately 6:00 P.M. MET, December 17, 1958.



Fig. 2—In the VOA long-wave station at Munich, four of these ML-5682 tubes in parallel produce a 500-kilowatt carrier at 173 kc. Four more take care of the modulation peaks, in a Doherty high-efficiency linear amplifier circuit. A second set of eight tubes completes the megawatt.

oscilloscopic view of typical jamming, "before" and "after."

It seems to go very much against the Yankee grain to take this sort of thing lying down. The initial reaction is an outraged "They just can't do this to us!" The next symptom is a preoccupation with devising ways and means to counter the jamming, ranging from putting a spitball curve on the transmitted signal, to installing an electronic "sucker-upper" to make the jamming signal disappear. However, no one yet has figured out a successful way around jamming, largely because of a fact of physical life known as the inverse square law, which shows that the transmitter closest to the target receiver will always win. In spite of the affront to the Anglo-Saxon spirit of fair play, the Russians continue to jam with great verve, elan, and effectiveness.

Philosophy of Jamming

It is possible to work oneself into a considerable snit over this, by arguments involving phrases like "violation of international agreements," "freedom of speech," "law and order," etc., but it is only reasonable to look at the Russian side of the picture. Every sovereign power, they point out, reserves unto itself the right to close its borders to people and ideas said sovereign power doesn't like. For example, the United States will not permit immoral literature to be mailed to its citizens from abroad, and similarly the entry of printed matter advocating the overthrow of government by force is frowned upon. The U. S. has in the past put heavy pressure on a neighboring country to reduce or suppress irresponsible English-language radio broadcasts directed specifically at the U. S. and offering medical treatments of dubious value.

The Russian position is that they do not wish to allow foreign broadcasts to cross their borders in any language that is spoken in the U.S.S.R. As far as they are concerned, the United States is welcome to shout in English until it is blue in the face, but if anyone broadcasts in Hungarian to Hungarians, or Rumanian to Rumanians, and so on, the transmissions will simply be jammed.

If one operates on the assumption that the

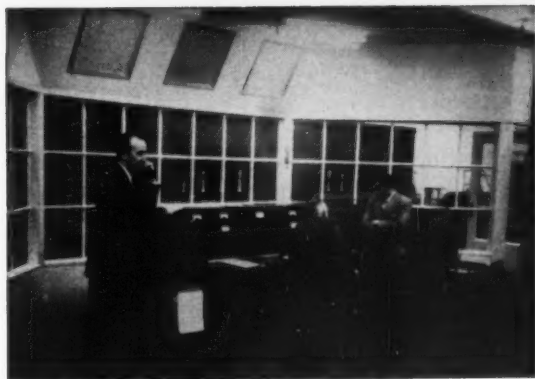
same standards of conduct ought to apply between nations as would apply between individuals, it is easy to talk oneself into the position that it is really the United States which is giving offense in the jamming war, because by sending out transmissions which the Russians consider objectionable and thus feel forced to jam, we are putting them to a tremendous amount of trouble and effort—all of which could be avoided if we stuck to our own knitting and broadcast only English.

Nor can the Anglo-Saxon powers claim that jamming is a tactic to which they themselves would never stoop. The fact is that Greek language broadcasts to Cyprus have been jammed by the British.² The reason? An understandable one—the broadcasts were inciting riots during the course of which British troops got killed. It is hard to imagine that the United States would behave differently if faced by a similar situation. Certainly, if U. S. occupation troops were being picked off by snipers directly inspired by external broadcasts, there would be a great deal of pressure on Congress by the families of the dead servicemen and others.

Unfortunately, it is not safe to assume that the standard of conduct of governments is necessarily the same as that of individuals. In the Paris edition of the *New York Herald Tribune* for December 17, 1958, there appeared an account (whose source was cited as the Associated Press) which illustrates the extremes to which one government, at least, is prepared to go in order to keep the Curtain intact. It seems that in East Berlin it is a punishable offense for citizens to cross the border into West Berlin and buy a newspaper. The *Herald Tribune* story told of some East Berlin newsboys who had been collecting rewards from the local authorities for turning in the names of East Berliners who were buying their newspapers on the wrong side of town. If this story is true, it helps place in context the enormous Russian jamming effort. That curtain must be kept closed at all costs!

² Paulu, *The British Broadcasting*. University of Minnesota Press, Minneapolis, Minn., 1956. See footnote, page 402.

Fig. 3—Control room of the 173-kc. megawatt at Erching. George H. Chapman, DL4BU/W5BEE, manager of the relay base, is speaking on the phone.



Types of Russian Jammers

Jammers are of two types — ground-wave and sky-wave. The latter are evidently connected by a remarkably efficient intercept and communications network, as the ability to whistle up additional jammers in a few tens of seconds so dramatically shows. A photograph of what is probably a Russian sky-wave jamming installation appears at the head of this article. Surprisingly enough, the jammers identify themselves by means of automatically-keyed i.c.w. call letters every 30 seconds or so. This is evidently to assist monitoring and control. Jammers in satellite countries key a letter and a numeral; those in Russia itself send two letters. Apparently to keep foreign eavesdroppers off balance, all jamming stations swap call signs every few weeks.

Western broadcasters have tested the efficiency of the Russian sky-wave net. For instance, the British once tried an experiment whereby they brought up, without warning, a broadcast transmission on a frequency they had never used before. Within a matter of minutes it, too, was completely jammed.

Ground-wave jamming stations have been installed in almost every population center in Russia and the satellites. Being moderately conspicuous, they are readily spotted by visitors. Large cities may have several such installations, which are characterized by antennas clearly intended for local transmission. One is in easy view of the American Embassy in Moscow.

The amount of effort involved in all this jamming activity is formidable. At Munich, the Voice of America has a station on 173 kilocycles (the European long-wave band) running a mere million watts of power. At this frequency, a wavelength is, by coincidence, just one mile long. As a result, directional antennas are — shall we say — a bit impractical. Does this stentorian voice get off scot-free? Not at all — it is also jammed. From signal strength measurements made at widely separated locations, with the knowledge that the jamming antenna is non-directional, it has been established that the jamming station or stations must have a total power of at least half a megawatt.

Amateurs throughout the world who have been annoyed by jamming in the 14-, 21- and 28-Mc. bands may wonder why the U.S.S.R. is jamming the amateur frequencies. These signals are actually the result of harmonic radiation from poorly-designed jamming transmitters operating in the 7-Mc. band — a fact which can be verified by listening to the jammer call sign on the exact harmonic frequencies of the 40-meter signal.

In general, the Russian jamming signals use fairly crude modulation forms. Some involve f.m., and some a.m., with the former perhaps the more common. It is surprising how effective a simple wobbled carrier can be.

The VOA's Munich Relay Base

Under the circumstances it is difficult not to be enthusiastic about the job being done by the Voice of America, and sympathetic in regard to the conditions under which it has to be done. Chief of the Munich Relay Base is George H. Chapman, DL4BU/W5BEE, shown in Fig. 3 in the control room of the 173-kilocycle megawatt. At Munich, in addition to the medium and long-wave stations mentioned above, there are two 75-kilowatt and two 100-kilowatt short-wave transmitters which were liberated from Hitler's government at the end of the war (Fig. 4). Program material for all these transmitters is picked up at a receiving station not far from Munich, at the Bavarian hamlet of Ueberacker. For the most part, transmissions direct from the U. S. A. are relayed, but when magnetic storms knock out the North Atlantic path a double relay via Tangier is often possible. The supervisor of the Munich receiving station is James C. Miller, DL4SV/W9NTV, who is also contributing editor for the s.s.b. feature of the *British Short Wave Magazine*.

Each program to be relayed is broadcast from the United States from several transmitters in several different wave bands. Thus the operators at Ueberacker have a choice of at least three frequencies per program, and there may be as many as four simultaneous programs. Since any given frequency from the U. S. may be less than perfect due to accidental interference, deliberate



Fig. 4—One of the two 100-kw. short-wave transmitters at the Munich relay base. There are also two 75-kw. transmitters, not shown.

interference, or propagation troubles, it is normal practice to have receivers tuned to each available transmission per program. The best of these transmissions is selected as the one to be relayed. The operator on duty constantly monitors the remaining frequencies, and is prepared to select another at the flick of a switch in the event that the program quality of the feeder originally selected deteriorates.

Since every transmission is picked up by three receivers operating in triple space diversity, this adds up to a remarkable array of equipment. Fig. 5 shows a view of the main receiving room. Some 26 dual and triple diversity receiving channels are available. These are fed from nine rhombic antennas through broad-band multicouplers. Since the monitoring operator must "ride gain" as well as select the best feeder, he is often kept about as busy as it is possible for one man to be. The Russians have been known to play a little game by jamming the feeders one by one, in an effort to find out which is being relayed at any given time. Thus far, it has been easy to keep them in the dark.

Methods for Countering Jamming

Although there is no known procedure for countering ground-wave jamming, there are nevertheless some tricks which can be used in the case of sky-wave jammers. In the first place, the jamming job can be made difficult by broadcasting on a large number of frequencies simultaneously. This increases both the number of jammers and the monitoring effort required. Furthermore, the jammers and monitors must be available

around the clock because broadcasts might conceivably come on the air at any hour of the day or night. As a practical matter, broadcasts are concentrated during the best listening hours, early and late in the day. The BBC, for example, beams all available transmitters directly at Russia for a half hour or so in the morning. A similar Russian-language "barrage" is turned on at night. During the rest of the day, the Corporation gets on with the job of broadcasting in a variety of tongues to every corner of the globe.

The real hope behind the barrage, of course, is the possibility that one out of the many transmissions may escape notice and sneak through. During the evening hours, a more direct anti-jamming scheme can be used. For example, consider the situation at twilight in Munich. Signals crossing the Atlantic from the United States are reflected from the ionosphere in the region where sunlight still exists and the bending power of the layers is high. But a transmission from Russia to Munich must strike the ionosphere within the zone of darkness, where bending power is low. Thus if a transmission from the U. S. is close to the highest frequency usable over a long path at that time of day, it is likely that no propagation at that frequency will be possible from Russia at all. The reverse situation, of course, exists during the morning: New York to Munich is in darkness, and a low frequency is required; Munich to Moscow is in daylight, and any frequency New York uses can be covered by Moscow.

It is also true that during most of the day the bending power of the ionosphere increases as one

(Continued on page 194)



Fig. 5—The main receiving room at Ueberacker—a true ham's paradise. The 26 dual and triple diversity receiving channels use SP-600, 51-J, and AR-88 receivers working into Pioneer and Crosby single-sideband adapters and combiners.

Hamfest Calendar

Alabama — The Mobile Amateur Radio Club will sponsor a hamfest in Mobile on May 16 and 17, at the Fort James Wright armory. Transmitter hunts, a dance, and meals. Continuous watch on 29.50 Mc. will be maintained for mobile talk-in. For further information, contact Ole Pearson, W4NC, P. O. Box 4422, Mobile.

Alabama — The Birmingham ARC will sponsor the annual Birminghamhamfest at the Alabama State Fair Grounds in Birmingham on May 3, preceded by a dutch supper Saturday evening, May 2. There will be equipment displays, joint meetings of all state nets, barbecue meal, several contests, and a citizenship award. This is a family affair, and previous attendance has run about 7500. Tickets are \$1.00, and may be obtained from the Birmingham Amateur Radio Club, P. O. Box 603, Birmingham.

Arizona — The northern Arizona hamfest will be held on May 30 and 31 at Whitehorse Lake, near Williams. There are plenty of good camp sites, and cabins are available at the lake or in Williams. Reservations must be made early, as this is the rush season. For further info contact hamfest chairman A. D. Fee, W7BFA, 133 North Cortez St., Prescott.

California — The San Fernando Valley Radio Club will hold its 3rd annual hamfest and picnic on Sunday, June 7, at the Victory-Van Owen Park, North Hollywood. For further information contact Arnold Dahlgren, W6UEI, 14940 Hartland St., Van Nuys.

California — The Fresno Hamfest will be held on May 2 at the Fresno District Fairgrounds. There will be open forum discussion, code speed contests, hidden transmitter hunt, mobile judging, special sessions for a.s.b., v.h.f., traffic, CD, YLs, etc. Ticket price is \$6.25, which includes general admission and the evening banquet. Registrations should be ordered from Radio Hamfest, P. O. Box 783, Fresno.

Georgia — The Amateur Radio Club of Augusta, Ga., will hold its annual hamfest on May 16 and 17 at the Julian Smith Casino and Park. The night-before activities will include a hamfest eve party with dancing, swimming, and dutch supper, served smorgasbord style. Dinner on hamfest Sunday will be southern barbecue served family style and all you can eat. Tickets are \$3.50 for adults. For more information contact either Bill Towne, K4KAR, 359 Heath Drive, Augusta, or Randy Watkins, W4OKL, Martinez.

Illinois — The Starved Rock Radio Club hamfest will be held on June 7 at the LaSalle County 4-H home and picnic area southwest of Ottawa, which is the same place as last year. Follow route 23 to south end of the Illinois River bridge at Ottawa, turn west on route 71, and then follow the big yellow hamfest signs. There is plenty of parking area and adequate facilities for all. Free swap section run on same basis as previous years. Advance registration prior to May 30 is \$1.00, otherwise \$1.50. The hamfest site is a short drive from the Starved Rock State Park and recreation areas. Food is available on the grounds. Free coffee and doughnuts for all those present at 10 a.m. For further information contact George E. Keith, W9QLZ, RFD #1, Box 171, Oglesby.

Illinois — The Quad City Amateur Radio Club will hold the annual Mississippi Valley hamfest on Sunday, May 24, at the Gra-ell picnic grounds. These grounds are located approximately 3 miles west of the Quad City airport on route 6, outside Moline. Advance tickets may be purchased for \$1.50, but will be \$2.00 at the rate. Order advance tickets from Bob Horton, K9IDN, 1808 9th St., Moline.

Illinois — Please refer to the note on page 10 of last month's issue concerning the banquet sponsored by the Western Illinois Radio Club. The date of this banquet has been changed from May 9 to May 16.

Kansas — The 12th annual Hamarama (formerly known as the Christy Picnic) will be held on Sunday, May 17, at Lake Shawnee, Topeka. There will be mobile hunts, activities for the XYs and YLs, and a covered dish luncheon.

Coffee and soft drinks will be furnished — you bring the covered dish. Ham auction. Boating. Stations on 3920 kc. and 29.6 Mc. for mobile talk-in. Registration is \$1.50. For further info contact D. Dressler, K0LAD, 4717 West Hills Drive, Topeka.

Missouri — The North Missouri Amateur Radio Club will hold its annual ham picnic at Moberly, in the Rothwell City park, on Sunday, May 24. Registration is \$1.00, and will commence at 0800. Bring your own lunch. Soft drinks and coffee will be furnished. There will be games and entertainment. Everyone invited. For further information contact Floyd Hughes, Salisbury, Mo.

New York — The Doud Legion Post in Rochester will be the scene of a western New York hamfest on Saturday, May 16. A fast-moving program for novice and old-timer alike. Special sessions on v.h.f., sideband, DX, and transmitter design. There will be a code receiving contest and a QSL card contest. Open house at the Antique Wireless Association historical barn museum (see the article on this barn elsewhere in this issue). Ladies' program. Equipment displays. Advance registration \$3.75, at the door \$4.25. Activities commence at 1:00 p.m., banquet at 6:30 p.m. Info and registrations from Rochester Amateur Radio Association, P.O. Box 1388, Rochester.

New York — There will be a family get-together and hamfest at Northampton Beach State Park on Sacandaga Reservoir on May 24, with an auction, entertainment, and contests. For further info contact F. H. Topping, K2KTN, Box 44, South Schodack.

New York — The Rome Radio Club will present its sixth annual ham family day at Beck's Grove near Rome on May 24, beginning at 1300. There will be transmitter hunts on six and ten, mobile judging, technical talks, and entertainment for the entire family, plus a chicken and steak dinner. Registration: adults \$4.00, children under 12 \$1.25, children under 5 free. Get your reservations from the Rome Radio Club, Box 721, Rome.

North Carolina — The annual Charlotte swapfest will be held on Sunday, May 24, at the Army National Guard, Municipal Airport, Charlotte. For further info contact Reagan Rowe, W4FHI, 2421 Weddington Ave., Charlotte.

Oklahoma — Beaver's Bend State Park, in southeastern Oklahoma, will be the scene of a hamfest on Saturday, May 30, beginning at 2 p.m. Swimming, boating and fishing. Contests. For more information, write Charles Free, K5DLO, 108 South Central, Idabel.

Pennsylvania — The Breeshooters 5th Annual Hamfest is to be held at the Lodge, North Park, Pittsburgh, on May 24 from 1000 to 2100. For further information contact Thomas J. O'Toole, 301 Orchard Spring Rd., Pittsburgh 20.

Saskatchewan — The Moose Jaw Amateur Radio Club is sponsoring the 1959 Saskatchewan hamfest on May 17 and 18. There will be a banquet, transmitter hunt, mobile judging, code speed contest, and the usual liars' contest. Registration fee is \$5.00 per couple, \$3.00 single. For further info contact the Moose Jaw Amateur Radio Club, c/o Canadian Legion, Moose Jaw, Sask.

South Carolina — The Charleston Amateur Radio Club will sponsor a hamfest on May 30 and 31, on the Isle of Palms, just outside of Charleston. A barbecue dinner will be served on May 31, at a cost of \$2.50. For tickets and further information, write to Raymon Mellard, K4YCT, 402 Hyde Ave., North Charleston.

Virginia — The Blue Ridge Amateur Radio Society is holding its fourth annual hamfest on May 17 at the Lakeside Amusement Park, between Roanoke and Salem on U. S. 460. Open house at W4CA on Saturday evening. Mobiles will be monitored on 3835 kc., 29.6 Mc., and 50.1 Mc. Registration is \$1.00, plus \$1.50 for the luncheon ticket. Children under 12 75¢. Plenty of activities for the whole family. For further information contact Ken Wyatt, K4BCP, P. O. Box 2002, Roanoke.

Washington — The annual Bremerton hamfest will be held May 16 at the Sons of Norway hall in Bremerton. There will be entertainment and fried chicken. Advance registration is \$4.00, and \$4.50 at the door. For further information and for advance tickets contact Ray McCausland, W7UWT, 3236 Wright Ave., Bremerton.

History in the Making

A Brief Account of an Unusual Organization

BY BRUCE L. KELLEY, *W2ICE, ex-W8ACY

This month rounds out 45 years of service by your League, of, by and for the radio amateur. During the course of 45 years many changes have been wrought, not the least of which are in the line of equipment. The Antique Wireless Association, an affiliate of the League, has dedicated itself to preserving some of the relics of amateur radio. Our cover this month shows a typical station dating about the time the League was founded. The other photographs in this article show typical stations that might have existed about the turn of the century, about 1920, and about 1930. (The photographs, incidentally, were taken by ex-W8TQV, who is about to become a ham once again.) Old timers will view these pictures with much nostalgia; hams of more recent vintage will marvel at the equipment used in the "good old daze"; all hands will mentally give a vote of thanks to the Antique Wireless Association for having engaged in such a worthwhile project.

THERE is excitement in the new; there is equal drama in the old . . . and so it is with amateur radio. Prior to World War II, very little interest was shown in the history of our hobby; however, by 1946 amateur radio was approximately 46 years old, the ARRL had been in existence for 31 years and the large number who joined the amateur ranks in the early 20's were now old timers at the quarter-century mark. As a result, many amateur clubs throughout the country were beginning to have an annual "Old Timer's Nite" and several social organizations

* 4 Main Street, Holcomb, N. Y.

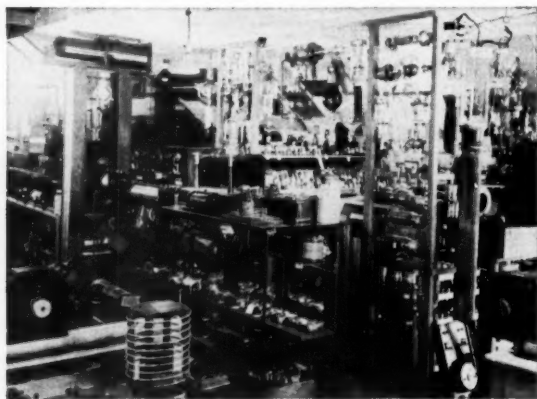
were formed catering to the old-time operator.

As a rule, this sudden interest neglected the material side of early wireless, or radio as we know it today. Aside from a few private collections assembled by some thoughtful old timers, the only historical material available for the amateur was some early equipment on display at the League headquarters and the exceptionally well written history of amateur radio by Clinton De Soto, *Two Hundred Meters and Down*.

It was only natural that some enterprising amateurs would eventually undertake the task of collecting and compiling the historical background of their hobby as a group. The Antique Wireless Association is such an organization.

The nucleus of the club is an original collection of historical equipment and films which I had gathered. Frequent requests for these programs and historical displays proved too great a burden for one individual. W2GB and W2QY, two able old timers, came to my aid in 1953, and thus was born the AWA. Today the organization has several hundred associates in the United States, Canada, Hawaii, England, Germany and South Africa.

The club directs its energies in three directions. It maintains one of the largest amateur club museums in the country. Operating strictly on a non-profit basis, it has collected and tagged, with the donor's name and call letters, thousands of early tubes, receivers, transmitters and pieces of equipment, some dating as early as 1850. Name plates marked Murdock, Clapp-Eastham, Electro-Importing, Grebe, Adams-Morgan, Federal, DeForest, Wireless Specialty, Mignon, Amrad and Marconi are familiar sights on the various shelves or showcases. In addition, one can find a



Here are some of the ten thousand items on display in the museum of the Antique Wireless Association. Makes you want to visit there, doesn't it! Thousands of people from every continent have toured the museum.

vast assortment of magazines, catalogs, photographs and tape recordings on file for the historian. Of particular interest are the four mock setups of amateur stations dating 1901 with coherer and spark coil, 1915 with crystal detector and fixed spark gap, 1922 with regenerative receiver and rotary spark gap, and lastly, a modern setup of the early 30s with an FB-7 receiver and a crystal-controlled transmitter using a pair of 210s in the final.

All of this equipment is on display in a barn museum located on my property. It is a two-story carriage barn crammed full of old gear. Out in front is a small sign bearing the legend "A.W.A. — Bruce Kelley." The barn museum is always open to the public. If visitors can't locate me, they can go across the street and up a few doors to the home of W2VTR, Bruce Elle, who will show them around.¹ We prefer to have groups or special visitors drop us a line in advance so that

¹ Don't be confused by the fact that the *Call Book* shows W2ICE as living in Holcomb, while W2VTR, just up the street a few doors, is in East Bloomfield. The answer lies in an ancient town feud, an interesting story in itself! Ask W2ICE about it when you visit the museum. — Ed.

proper arrangements can be made. Holcomb is located about 23 miles south of Rochester, and about 5 miles south of NYS Thruway Exit No. 45.

The collection is the result of many hours of traveling countless miles and scrounging through hundreds of dusty attics and cellars. The club's greatest concern is to prevent the amateur from throwing unused antique equipment into a junk barrel.

Using this material for background, the club's amateur photographers have carried out the second objective of the AWA by producing a number of historical movies and slide shows for amateur meetings. These shows are eventually turned over to the League to loan out to affiliated clubs.² The popularity of the shows can be measured by the ever-increasing requests. An early production, "The First Thirty Years of Amateur Radio," was rated the most popular show in the ARRL film library for 1957. The organization's

² The following two AWA slide collections are available to all affiliated clubs:

- a) "The First Thirty Years of Amateur Radio."
- b) "... The Story of DX" (See page 103 this issue).

In the photograph below at the left is the sort of station that you might have had in about 1901. This one, of course, is a mock setup in the Antique Wireless Association museum. At the left in the photo is a paper tape recorder of the sounder type, and then in the center a straight spark coil without helix, and then a coherer and tapper and primary cells. Note the telephone receiver — in those days the now-common headset had not been invented! In the photo at the right W2GB sits at a mock setup of a typical 1920 station, one that might be described as the end of an era. Over at the left is a spark gap with its oscillation transformer. Below the oscillation transformer (those big coils, kids) is a box which held the glass-plate capacitor. Behind W2GB's head is a Grebe short-wave receiver, while directly in front of him is a longer-wave receiver.





Here we have a mock setup of the early 1930s. Across the table, from left to right, are an FBX receiver, a pre-selector, a power supply, and an SW-3 receiver. The shelf above holds a crystal-controlled transmitter using a pair of 210s in the final. Those were the days!

"Story of DX" set an all-time record when it was presented at the 1956, 1957 and 1958 ARRL National Conventions — the only program ever scheduled at three conventions! A new show in the making is one covering the life of Marconi. Old time operators such as W1SS, W1ZE and W2LF, as well as G. G. Hopkins, Marconi historian of Chelmsford, England, will be seen and heard in this amateur production.

The third objective of the Antique Wireless Association is to display equipment at various gatherings. Handling and transporting such equipment would normally present a problem to an organization working without funds; fortunately the president, W2GB, is in the trucking business and amateurs across the country have had an opportunity to view everything from old loose couplers to huge spark transmitters. Worthy of note is the fact that the AWA exhibit was awarded a first prize at the 1958 ARRL National Convention (Washington) as having one of the outstanding amateur exhibits.

Many recently licensed amateurs visiting the barn museum or viewing one of the shows have wondered at the inclusion of early commercial equipment. There are several explanations. In the early days of wireless the amateur's transmitting range was limited. Hence, DX was strictly on the receiving end and calls such as CC, FL, POZ, and NAA were as familiar as WIAW is today.

Likewise, the early amateur would frequently

operate on a wavelength very close to a commercial station and it was not uncommon for the two to communicate with one another (and interfere!). This sentimental tie is recalled when the visitor views early equipment such as a magnetic detector or a 10-inch spark coil in operation or possibly the 1/4-ton capacitor from old NAA. Apparatus from the historical German stations at Tuckerton and Sayville or the early Marconi installations at New Brunswick, Marion and South Wellfleet occupies a space by itself.

For demonstrating purposes, W2QY, the club's craftsman, spends his evenings restoring or making equipment that no longer can be purchased since the days of the E.I. and Duck Catalogs. Because of his efforts we have perfect working models of coherers, magnetic and electrolytic detectors and other pieces of equipment of a forgotten era. Many of the museum items, as received, require replacement of missing parts as well as a general cleaning. Even some of the early crystal sets and one-tube receivers are mounted in mahogany cabinets with panels covered with a multitude of knobs and binding posts.

The club has in its organization many old timers who can assist the layman interested in seeking information of the past. This group includes W1SS, W2AE, W2AXR, W2BB, W2CTA, W2LF, W2LK, W2PZH, W2ZI, W3YA, W4ZM, W6ELW, W8JDV, W9EWH and G2MI. If your club is planning an "Old Timer's Nite," call on an AWA member; he will be glad to assist. **QST**



Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

[CORRECTION: In this section of *QST* for March, the call of Edward M. Blaszczyk, W3KVQ, who wrote the letter under the heading "Exclusive," erroneously appeared as W3KVG. Our apologies to both amateurs.]

STUTTER?

7216 Manitoba Drive
Jacksonville 11, Florida

Editor, *QST*:

Why why do so many many Novices Novices insist on sending a double double "de" "de" between between station station called called and and their their own own call call??

Who who started started this this??

— Harry A. Cole, W4DLL

NONE . . .

10744 Danube Avenue
Granada Hills, California

Editor, *QST*:

. . . I notice in the past two years or more that virtually no circuits for building s.s.b. rigs or receivers ever appear in *QST*. To be down to earth for just a moment, you guys pushed this thing on us, told us of its so called great merits, provided a few circuits and then increased your advertising many times by selling commercial gear. I am still old fashioned, build everything—rig, receiver, and antenna. You people continue to publish circuits that create interest and I am still behind your good efforts, but I would like to get into s.s.b. . . .

— John Oliver, W6LZS

. . . OR TOO MUCH?

P. O. Box 453
Green River, Wyoming

Editor, *QST*:

I'm letting the *QST* go this year. I'm not interested in s.s.b. and that is mostly what is in *QST* now, so cancel my name from mailing list and ARRL.

— L. C. Strong, W7PJA

SURVEYS

P.O. Box 243
Stratford, Connecticut

Editor, *QST*:

I was pleased to read in your editorial in March *QST* that you were soliciting general views from your membership every now and then as to the material they like to see in *QST*. However, as one of the many members who were not included in your random sampling, I believe this questionnaire should be made available to all the members as this would give you what the majority of the members want and not only what a few selected at random want. . . .

— Raymond L. Lasonde, W1LEA

[EDITOR'S NOTE: At one time questionnaires were indeed sent all members and tabulations were made of the thousands returned. However, it was found that a tabulation of a random selection of several hundred produced results identical to the overall survey, so that the larger survey only made extra work for all concerned.]

RELIGIOUS QSLs — REBUTTAL

Mystic Congregational Church,
Medford 55, Massachusetts

Editor, *QST*:

It was with considerable interest that I read the letter from Mr. Michels, XE2GR, in the March issue of *QST*. I have been a ham for almost a year and a half now and have never noticed the objectionable religious emphasis on the

bands which Mr. Michels mentions. I think that on the whole most professional religious men are much less obtrusive than, for example, the doctors. For example, I have worked a number of doctors and lawyers but only on one occasion did I work another minister, at least that I knew about. Moreover, no one has ever discussed religion with me, or QSL'd me with religious literature.

I think that when we consider the vast number of professional religious men who are hams and also the tremendous number of hams who have religious affiliation (most of them do!) the number of incidences such as was suggested are very low indeed. However, I would like to point out that the violation of ethics which was pointed out apparently did not occur on the ham bands but rather in the correspondence resulting from the radio contacts. On this point I think it should be noted that no regulation covers this as far as I know. In this country everyone has a freedom to say what he likes, about religion or anything else. If a person includes a religious message with his QSL it is usually the result of sincere concern for others and can hardly be called "careless ham operating." I think Mr. Michels should rejoice that there are people who are concerned about the souls of men, tear up the QSL and forget about it.

Being a ham is a great privilege. It is furthered by co-operation and criticism—but the criticism must be constructive.

— Reverend Ward A. Knights, K1DUN

First Presbyterian Church
Winamac, Indiana

Editor, *QST*:

I noted with interest XE2GR's complaint at finding religious tracts included with QSL cards. Here is one Presbyterian minister who agrees completely with the complaint. However, I am under no illusions that either his letter or mine will make any difference to those who seek to use amateur radio as a means of furthering their evangelistic efforts. Past experience has taught me that such persons are subject to none of the ordinary canons of good taste. They will continue their efforts blissfully unconcerned at the fact that for every convert made hundreds more are alienated, some permanently. If this letter is published, I shall be surprised if I do not receive several communications accusing me of apostasy.

But I at least want XE2GR and other victims to know that such methods are not normative for American Protestants, and that most clergymen are as repelled as he is.

— Reverend Mayo Smith, K9LTA

NO EXAM CHANGES

37 Wanton Shippee Road
East Greenwich, Rhode Island

Editor, *QST*:

FCC has changed the general class examination, effective January 1, 1959. There are now more questions from the Amateur Extra exam, and there are six or seven exams. I would like to know what the new questions are.

— Robert Young, KN1HWK

[EDITOR'S NOTE: There have been no changes in the overall scope of the examination. Often questions are reworded, but anyone who knows and understands the answers to the sample questions is adequately-equipped to pass the exam.]

INTERNATIONAL FRIENDSHIP

18 Fairfield way
Barnet, Herts., England

Editor, *QST*:

During the past few years, when the very favorable sunspot maximum conditions have made it so easy for trans-Atlantic contacts on the h.f. bands, a great number of friend-

(Continued on page 182)



Operating News



F. E. HANDY, WIBDI, Communications Mgr.
GEORGE HART, WINJM, Natl. Emerg. Coordinator
PHIL SIMMONS, WIZDP, Asst. Comm. Mgr., C.W.

ROBERT L. WHITE, WIWPO, DXCC Awards
LILLIAN M. SALTER, WIZJE, Administrative Aide
ELLEN WHITE, WIYYM, Asst. Comm. Mgr., Phone

Hawaii to be 50th State. Congress has acted once again, this time to make it possible for Hawaii to become the fiftieth state in the U. S. A. We'll all join in this hearty welcome for the KH6s. With over 1200 KH6 calls in the book amateurs striving for ARRL's Worked-All-States Award should have no complaint. As we see it, Vermont and Nevada, or the Dakotas will remain those reputed to be hardest-to-get. Over the next several months it will require the approval of the people of Hawaii in a territorial referendum, and their action then to nominate and elect their own state officials to lay the groundwork to permit another Presidential Proclamation to establish Hawaiian statehood.

Only from the date Hawaii is officially a state, can the KH6 written confirmations start becoming valid pasteboards for a state credit for WAS.

A.R.R.L. ACTIVITIES CALENDAR

May 7: CP Qualifying Run — W6OWP
May 19: CP Qualifying Run — W1AW
June 3: CP Qualifying Run — W6OWP
June 13-14: V.H.F. QSO Party
June 17: CP Qualifying Run — W1AW
June 27-28: Field Day
July 2: CP Qualifying Run — W6OWP
July 18-19: CD Party (c.w.)
July 23: CP Qualifying Run — W1AW
July 25-26: CD Party (phone)
Aug. 5: CP Qualifying Run — W6OWP
Aug. 21: CP Qualifying Run — W1AW
Sept. 3: CP Qualifying Run — W6OWP
Sept. 16: Frequency Measuring Test
Sept. 19-20: V.H.F. QSO Party

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

Apr. 25-26: PACC Contest (c.w.), VERON (p. 77, last month)

Apr. 25-26 and May 9-10: Bermuda-U.S.-Canada Contest, Radio Society of Bermuda (p. 78, last month).

Apr. 25-26: New Hampshire QSO Party, Concord Brasspounders (p. 281, last month).

May 2-3: PACC Contest (phone), VERON (p. 77, last month).

May 8-10: West Virginia QSO Party, Mountaineer ARA (p. 156, this issue).

May 16: Armed Forces Day Receiving Competition and QSO Party, Dept. of Defense (p. 67, this issue).

Cards confirming contact prior to such date, while good for DXCC or proof of a general contact, cannot be counted for state-credit until date of the Presidential announcement.

When Hawaii legally becomes our 50th State, the date will be announced by a W1AW and ARRL Bulletin, with confirmation in the earliest following issue of *QST*. Until then do not submit any Hawaiian cards for WAS credits, please.

WAS Rule to Apply as It Did for Alaska. In September '58 *QST* (page 78) we explained the situation of Alaska's pending statehood, some four months before it became a fact. (See also Feb. '59 *QST*, p. 78.) With Hawaii we have a good parallel. No change is contemplated in processing WAS cards until the date of Hawaii's admission to the Union. The WAS rules already state the simple requirement: *Two-way communication must be established on the amateur bands with each of the states.* This is the second time Congress has re-defined our "each" in this rule. When we know the Hawaiian statehood date (to pass along via W1AW) we expect again to allow a six-month's grace period. This is for amateurs who have made their 49 states. It's a period to collect the QSLs and get them in for your certificate "as of the last date" the U.S.A. had only 49 states. WAS would not really carry its true meaning, if the recipient didn't in every case work all states as of the time a WAS was issued. Policy has had to be based on that. It looks as though '59 is to be an historic year when for the only time in a half-century, the United States is adding (in quick succession) two states. Last month we indicated on this page the calls of those first officially to include Alaska in their WAS-package. In the future, which new WAS will have the first KH6s to be worked after the new statehood proclamation soon coming up?

Club Establishes Novice QSL Service. In Omaha, Neb. Novices not listed in the *Call Book* are invited to send their call, name, address and telephone number to Box 626, Omaha. The Ak-Sar-Ben Radio Club has set up a local arrangement to help newcomers to amateur radio that might well be emulated by other clubs. Consider good novice programs as a means to stimulate sound and progressive club growth and activity. The following is from *Ham Hum*: "Each month the Club receives a number of QSLs for Novices because of incorrect or lack of address. Since the addresses for new stations are unobtainable for a period, *Ham Hum* compiles a listing of the novice calls. Novices are asked to send lists of other local novices, giving QTH,

telephone number and other information. Should any QSL cards then be received, all these can be routed promptly and properly. Subscription to the club paper is included in the arrangements for membership in the Club."

Apropos the A-1 Operator Club. The rules for this recognition of high class operating ability are clearly set forth (page 5 of *Operating an Amateur Radio Station*). A segment of the rather considerable A-1 Operator group is circulated by ARRL Hq. each year just to solicit fresh prospects among both phone and c.w. operators who are active on the air. In this ARRL asks particularly that amateurs be nominated based on critical judgment of their radio operating technique. It takes *two* separate and independent nominations placed on the record to 'make' a new member of the A-1 Operator Club. Readers are referred to page 82 of May '56 *QST* for data on the required spontaneity of such nominations. Some current commentary is excerpted from the *Virginia Ham* as having direct bearing on this also.

"The recent listing in Oct. '58 *QST* of addition to the A-1 Operator Club roster prompted some non-members to approach known members and request nomination! Let it be said here and now, that it has always been a tradition among A-1 ers *never* to nominate one — even though he may otherwise be eligible — *who asks for it*. Such a request can be embarrassing to the requester, especially if the requester be obviously not worthy. A-1 membership is an *honor*, one that should be earned purely by constant observance of the highest standards of operating procedure, courtesy, judgment and copying ability. It should under *no conditions* be awarded on a basis of friendship alone. To do so merely degrades the certificate to the level of empty wall-paper.

"We have even heard of persons requesting nomination on the basis of a single and relatively casual contact! This is comparable to proposing to a gal on the basis of one quick handshake! It is patently impossible to appraise an operator's overall ability on such short acquaintance, even during a QSO involving an appreciable amount of traffic handling. . . .

"Ergo: If you aspire to A-1 membership, read up on the rules of the air; observe same; *never* under any circumstances request nomination. Thus: when you are nominated you are sure you earned a genuine honor." . . . de W4KX.

Building Club Membership. The St. Paul Radio Club, Inc. and other clubs in the (Minn.) area have long encouraged and arranged assistance for the newcomer. This year's sessions for classes are sponsored by the St. Paul Public School's Adult Education Department in co-operation with the club. W0BUO is again this year teaching the code and theory. It is said that during and after each series of lessons the club finds an increase in attendance of around 25 members. All these were encouraged in their efforts through the classes . . . a real club membership-building setup!

FD Log Forms Now Ready. Clubs and individuals can now get off a radiogram or postal card to ARRL requesting June Field Day forms. These will be sent gratis (deferred mail rate) unless of course you provide necessary postage and indicate a specified faster type of mail. Even then we urge you *not* to put off sending for the forms, if you are planning to set up afield June 27-28 this year, as of course you are. With better than one thousand groups going portable or mo-

bile, there are bound to be some bottle necks in stuffing envelopes for those who wait until the last minute. Starting in May, however, we are resolved to keep the decks clear day by day, so (please) let those requests come early, so we can guarantee our best service.

Are YOU Ready? Speaking of the "FD," this is bound to go most smoothly, pleasantly, and effectively if you have made some plans ahead of time. Besides a full page discussion of how-to-plan (p. 83 Apr. '58 *QST*), we made reference to this in March '59 *QST* so we're not going to elaborate again. Many operators give their emergency power supplies a workout *every three or four weeks* through the year, so the gear isn't found gummed up, rusted and useless in meeting real disaster needs. Many others we dare say, have good equipment that needs a check up, if not a thorough overhaul after a winter's inactivity and disuse. So may we urge some testing of all the component gear that makes for successful emergency operation well in advance of our Field Day?

Advance planning, building and testing of equipment, whether in net operation, private schedules, as demonstrations for club benefit or combined with family outings and picnics, cannot fail to work toward best chances of fun and success in the FD, or if emergency needs arise. Preparedness pays off. That's why we have our ARRL Field Day. See you there! — F. E. H.

MEET THE SCMs

William F. Kennedy, Georgia's SCM, still has the call W4CFJ, which he was assigned when he received his first license in 1931.

He holds membership certificates in the Rag Chewers', A-1 Operator and Old Timers Clubs and is active as Official Relay Station, Official Phone Station, Official Experimental Station, Official Observer and Official Bulletin Station. The



SCM W4CFJ

current president of the Georgia Cracker Club, he also is a member of the Atlanta Radio Club, the Confederate Signal Corps and the Albany Radio Club. Six Public Service Awards have been issued to him for noteworthy work in floods, tornados, hurricanes and other emergencies; he has actively engaged in training Boy Scouts toward earning their Merit Badges. In addition, he finds time to take part in ARRL Sweepstakes, DX Contests, LO and CD Parties.

The rig at W4CFJ includes a Heathkit VFO, a 6AG7 buffer-doubler, an 813 buffer and a pair of 357B tubes in push-pull with 1 kw. on all low-frequency bands. A 25-watt homemade mobile also is available. An HRO STA-1 and a BC-669 serve for reception and a doublet is in use for an antenna.

Bill's favorite sports are golf and fishing. He previously taught radio and TV nights at Smith Hughes Vocational School, but for the past ten years has been chief engineer at radio station WERD in Atlanta.



A great many amateurs have become accustomed to thinking of the service aspects of amateur radio in connection with some other service. That is, as a stepping stone to something bigger, better. To many amateurs it has been just that. Out of nearly any group of communicators or electronics experts you can always find a considerable segment who got their start out of a youthful interest in amateur radio. That's why our early procedures were patterned after those of commercial services and the military. What good was amateur operating, the reasoning went, unless it prepared you for something better?

But somewhere along the process of evolution, amateur radio has started to emerge as a service in itself. It started being called "the amateur service" in international documents, and the feeling began to take hold that we had something to offer in the way of service on our own bands, in our own name. Our operating procedures began to crystallize, to show slight differences, to adapt themselves to needs that



The New England Weather Net held its annual meeting on Jan. 31 at Radio Station WBZ in Boston. Fifty-seven members were present. During the meeting a ceremonial presentation was made to Don Kent, WBZ weather forecaster, of a crystal-controlled receiver built by W1KVX so that Don could eavesdrop on the net whenever he wished. Shown standing in the picture, left to right, are K1BEN, W1YCR, Mr. Kent, W1KVX and K1BNW.

(Photo by K1BEN.)

are characteristically amateur and not particularly applicable to either commercial or military services. Somewhere along the line, we became aware of the fact that there was such a thing as an *amateur service* which served as typical a need as did any other kind of service. We didn't stop being the reserve of technically-skilled personnel that the armed forces needed, nor the pool of operators, nor the pioneers in the radio art, nor anything else we had ever been before. But we did start becoming a service on our own, with our own procedures, methods, objectives and idiosyncrasies. We developed our own emergency and traffic services — always for the purpose of serving the public, mind you, but in our own name and our own way.

This evolutionary process met with some resistance, of course. There were, and still are, those who feel that we should adapt our methods to those used by other services so that we might be better prepared to operate in those services should the occasion warrant. Our own message form, our own phonetic alphabet and our own "lingo" is often looked upon disdainfully by some amateurs whose operator training was in other services or who have become affiliated with other services during their amateur careers. Many of them have brought other procedures to the amateur bands and

put the pressure on us to change ARRL-recommended procedures to conform. Sometimes we have responded to such pressure, sometimes we have not, depending on the apparent willingness or desire of the average amateur to conform and the logic of so doing.

One thing is certain: that as long as we are the *amateur service*, we cannot adopt the procedure and organizational precepts of any other service one hundred per cent and still expect to be universally adaptable to the problem at hand. What kind of communicators shall we be? Red Cross? Civil defense? Military? Civil Air Patrol? Post office? Weather Bureau? State police? Or, perhaps we should split up, you serve your favorite and I'll serve mine? What a dilemma, with so many agencies and organizations trying to use us!

We think that we should be *Amateur Communicators*. Note the capitals. An amateur is not necessarily an unskilled person, but many people have this impression. When we use our amateur frequencies and our FCC amateur licenses to perform a service, we are doing so as the *Amateur Service* primarily, and only secondarily as sheriff's deputies or civil defense officials or military or naval officers. Let's not be blinded by the glitter of equipment or the glamour of titles; for in our status of amateurs in the *Amateur Service* lies our chief defense of our frequencies and operating privileges; frequencies and privileges which we have retained because some of us have used them to render services, and which we shall continue to retain only if we continue to so use them — in our own name.

We're sorry we weren't able to run an announcement on Operation Alert, which was held on April 17-18, and in which AREC units were urged to participate. It wasn't our fault, but we're sorry anyway. We hope that those of you who did participate will forward particulars and comments to your ECs or SECs so that we can have some sort of writeup on the activity in *QST*. If you have any pictures, don't forget to ship them along.

More information on amateur participation in emergency communications in connection with the midwestern floods and ice storms of mid-January has come to us since the details printed in this column last month. This sort of thing happens frequently. If we had omitted all the dope we printed last month, we'd have been chided for printing it this month as "ancient history." As it is, we only get chided for disconnection in the continuity of activities and possible repetition. Anyway, here's this month's installment:

In Miami County, Ind., EC W9EJC alerted the AREC organization when the Wabash River reached a dangerous flood stage. Flood walls kept the river in place until an ice jam down the river caused it to rise more rapidly, then evacuation started with a vengeance. The AREC offered its services to the police, who were trying to get all families out of the danger zone in Peru, but they had plenty of communications, so the Red Cross was contacted and gratefully accepted help. A six meter portable was set up at Red Cross headquarters, and W9EJC's home station was used as control. Mobile K9a GPO MNI, W9a MLF and QXL were used, with assistants K9a IOO LVK, KN9a LVV MKY and MWU, to patrol the river and report danger spots. The AREC received public thanks and praise for its efforts, and the only complaint from the amateurs was that they couldn't find enough to do.

On January 21, as a result of the severe snow and ice storm in Central Illinois, amateurs in the Peoria area were alerted to aid in establishing communication between Clinton and Pekin for the Illinois Central Railroad. For the first 30 hours W9MXD held down the job alone, operating in the Illinois Emergency Net, and then was relieved by W9IOG. Other operators took part in two-hour shifts as it became apparent that they were needed. Among those not mentioned in April *QST* are W9a NVX IUL NKM FM, K9a KTZ KZO LHP EHP.

On Jan. 22, the EC for Jefferson County, Ohio, W8ERR, alerted the county AREC unit to supply communication for the Red Cross during the Ohio River flood. A station was set up at Empire, 12 miles north of Steubenville and another at Brilliant, 10 miles south. A base station was located at Red Cross headquarters in Steubenville and two 75-meter mobiles were used as liaison between these stations. The following AREC members served as operators for a total of almost 250 hours: W8a DNQ ERR ZRI AYR JNL OBQ,

Allen R. Breiner, W3ZRQ, the active and energetic EC for Schuykill Co. (E. Pa.) finished this new operating position just two days before the Simulated Emergency Test last October, and wanted us to have a look-see. Neat, eh?

K8s DTO LQM BYF GHN GEH HMJ NAM, W3ZWH. — W8ERR, EC Jefferson County, Ohio.

During the tornado which struck the St. Louis area on Feb. 10, an emergency net was organized on 3900 kc. with K8SIO, station of the Westminster Amateur Radio Society, as net control. K8DBM was the St. Louis contact and W8OMM was NCS for a short time when W8SIO was having antenna trouble. A total of 43 stations checked into the net and 110 messages were handled between 0800 and 1700. K8SIO was operated by K8BVO and K8LJZ. K8DBM was on the air for nine hours without a break.

On Feb. 11 the Vigo County (Ind.) Office of Civil Defense issued a call for volunteers to combat the devastating flood waters of the Wabash River. The AREC provided "round the clock" communication for this operation for five days, keeping W9CBR, station of the Wabash Valley Amateur Radio Assn. located on the top floor of the Terre Haute City Hall, in operation for five days. Not less than two mobiles were also on hand for the full period at the scene of the construction of the sandbag levee in West Terre Haute. The AREC handled all communication relative to the procurement of and proper disposition of 140,000 sandbags, 600 yards of sand, 1200 yards of gravel and enough crushed rock to construct a half mile of roadway along the base of the levee. The AREC group supplied 1532 man-hours of work and burned 162 gallons of gasoline. The amateurs worked in six hour shifts except when no relief was available, in which case they worked longer. Among those taking part were W9e VMI SYM KT MOR RDG YBN QOX LIG AHN ZSW KOG UUU NZH IHO ZHL, K9e EJO BSM EBK MVI ITK EJU GBI IGS HTR JCR HTN EFO HTL. — W9UUU, EC, Vigo County, Ind.

On Feb. 28 a six-meter mobile emergency net was formed in Seattle's Magnolia Bluff area to assist in a search for a missing 3-year-old boy who had wandered away from home about 1700. K7BAG notified W7BRB, who offered the services of the six meter net to the police, and within an hour and a half twelve mobiles were in the search area with W7BRB acting as NCS. Contact was maintained in this way between the searching teams and Seattle police, coordinating the teams into an efficient search pattern. The boy was found unharmed, and the mobiles stayed on the job until the boy had been returned to his parents and all search teams had been disbanded. Other amateurs participating: W7e UZB PAE FAS RT FSW HFC AGJ DJN KZP FNY CIO CYQ, K7e BJV DBP AVH BAG ATG AXB HFN. — W7PGY, SCM Washington.

By coincidence, on the same day as above another 3-year-old boy was lost near Elvaton, Md., and the Anne Arundel Radio club had six mobiles join in the hunt. This little boy was also found asleep in the woods, unharmed. — W3UCR, SCM Md.-Del.-D.C.

On March 11, K5SAF heard W3SOX calling for help on 15 meters. It turned out that W3SOX was mobile on the Pennsylvania Turnpike and that he had come upon a bad accident in which several people were injured. After making contact, K5SAF put in long distance calls to the McKeesport Police and the Pennsylvania State Police at Greensburg, both of whom promised to dispatch help at once. At this time there is no further report on this incident.

The rapid rise of the Allegheny River in Warren County, Pa., on Jan. 22, brought the Warren County RACES group into operation. Equipment at the civil defense control center was placed in operation to maintain contact with mobile units and to establish radio links to the key relay station for the Western Pennsylvania CD Network and to MARS. Three ten-meter mobiles were dispatched to flooded residential areas to aid in evacuation operations. A sudden



cold snap avoided the recurrence of floods experienced in previous years, but the amateurs were on deck and ready to go. — W3NQA, Radio Officer, Warren County, Pa.

During the high water in Porter County, Ind., the AREC was continuously on the alert, and information on river conditions was received regularly from W9YEA to W9HKQ. On Feb. 8 W9HKQ called W9EEO to check the Hebron grade bridge for ice jam and possible collapse. W9EEO and W9ORW/m proceeded to the bridge and immediately radioed back the situation. The Porter County acting c.d. director also showed up, and several additional mobiles put in an appearance. Since the bridge seemed to be standing up to the onslaught of the ice, there was nothing to do but stand by and be on the alert. No emergency developed, but the Porter County AREC was on the job.

On Feb. 10 at 0830 the Knox County (Ohio) radio officer and EC were alerted for possible flood conditions. K8EEN was activated at an elementary school in the south end of the city and twelve operators showed up. Quick action in sandbagging the dikes prevented extensive flooding, however, so the emergency was declared over at 1800.

Mobile units of the North Penn Amateur Radio Club assisted Telford (Pa.) police in keeping an eye on mischief-makers during the Hallowe'en period. A base station was installed at the Borough Hall and an auxiliary policeman accompanied each mobile in the patrol, which kept a watchful eye on roving bands of mischief-makers to avoid any destructive turns. Three or four cars were on patrol for three successive nights. — W3ZXT, EC Montgomery County, Pa.

On January 20, Southeast Kansas started having freezing rain at 0900. SEC W0IFR called an AREC drill to keep track of icing conditions. Three control stations were set up and stations checking in were asked to report on icing conditions. The SCM, SEC and eight ECs took part to collate and coordinate reports from 91 Kansas stations and 30 stations from out of state. It was a completely unarranged drill, and W0IFR says he is very satisfied with the result. Had an emergency developed, they would have been ready to do a real job.

The Black Hills Amateur Radio Club (S. Dak.) assisted with a March of Dimes marathon on Jan. 10 over a local TV station. A two-meter link was used to pass traffic from the TV studio to two base stations which in turn relayed the messages to nine mobile units. The mobiles collected the money as it was pledged to the station. Almost a thousand dollars was collected by the amateurs with an average of 40 calls per mobile from 2030 to midnight.

The Cuyahoga County (Ohio) AREC took part in the Mothers' March on Polio on Jan. 28. Ten mobiles were used to pick up funds received at 40 collection points. An average of \$18,000 per vehicle was thus handled. This year, because of difficulty in maintaining 100 communication with mobiles in past years, two control stations were set up, one on the east side of Cleveland and one on the west side. They were linked to the portable at the March of Dimes head-



Among our more active ECs in Eastern Florida is W4RW, whose jurisdiction includes East Volusia County and Daytona Beach. Quite an impressive layout, eh?

quarters and a portable at the police station on a separate frequency. This greatly improved the performance. — W8AEU, EC Cuyahoga County, Ohio.

On Feb. 14 and 15 the Lake Wales, Fla., AREC provided all radio communications for the Annual Air Show. With a base station at the airport office, another in the control tower and three mobile units, a continuous flow of traffic was handled. All operation was on two meters. Novices as well as old timers participated. Airport management and the Chamber of Commerce said it would have been nearly impossible to put on the show without the support of the amateurs, and this was reward enough for the long hours of hard work by the gang to do an effective job. — W4LJM.

On February 27, thirteen units of the Tarrant County (Texas) Six Meter Emergency Net furnished communication for the simulated evacuation of the U. S. Public Health Hospital at Fort Worth. Amateur mobiles were placed at points of traffic congestion and reported to the base station on the movement of vehicles. Partly due to the efficient communication, 150 vehicles were off the reservation and re-entering within 15 minutes. — W5UXP

Nothing like starting the year off with a bang. We received 26 January SEC reports, representing 7716 AREC members. This is a good head start over last January. Sections reporting: Ga., S. Texas, E. Fla., N. C., Colo., San Joaquin Valley, N. Mex., E. Bay, Minn., W. Va., N. Dak., Mo., W.N.Y., Maritimes, Wash., Ind., Vt., Mich., Nevada, Ala., Ont., Santa Clara Valley, Wis., R. I., NYC-LI, Neb.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (KC.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

Races News

From the Northern Lights Carrier, bulletin of the Anchorage, Alaska, Amateur Radio Club, we learn that RACES is staging a comeback in Anchorage. The new setup will be completely mobile—that is, will be capable of being taken anywhere, any time, and set up on short notice. Some twenty new 2-meter units are being purchased with this in mind, and these will be distributed to the amateurs in RACES to be used for RACES purposes, and to be retained only if the amateur takes part in RACES drills and activities. This is the latest RACES news from the latest state.



The Portland, Ore., Six Meter C.D. Net operates on 50.55 Mc. each Thursday at 2100 PST. Present membership is about 30 stations with an average 25-station check-in. On the last unscheduled practice alert 18 stations were

checked in within half an hour. NCS is rotated and mobile NCS have been operated from the various official evacuation staging areas with very successful results. — W7HIO.

Did you take part in "Operation Alert" on April 17-18? If so, we'd like to have some dope on what went on so we could include it in the QST write-up. Hw?

TRAFFIC NOTES

This is the time of year when we get statistic-happy, by request. At the moment of writing we are not yet prepared to give you full statistics on the 1958 traffic year in general (maybe next month), but advance indications are that we had another big traffic year, again exceeding previous post-war years. This is in line with the increase in amateur activities in most fields. Whether or not interest in traffic handling is increasing out of proportion to other activities is pretty hard to determine. All we know is that it is still on the upgrade.

We think that this might be a good time for us to take a closer look not so much at how much traffic we are handling, but at how well we handle it. Some of our old-time traffic men are worried about the latter. So are we. Arguments are rife on the subject of accuracy versus speed. Lately, we got to thinking this over and came to the conclusion that it can be worked out by formula: $E = AS$; where E is efficiency, A is accuracy, and S is speed. In other words, we want our traffic to be accurate and at the same time to arrive at its destination as quickly as possible. This product of accuracy and speed is the efficiency of our amateur traffic-handling establishment.

If figures, when traffic is garbled (i.e., inaccurate) when it is delivered, this is poor public relations. But it is just as poor public relations to have it arrive two weeks after it originates, even if it is accurate. So what we are really after is a combination of the two rather than emphasis on either of them. What we are really after is efficiency.

In order to achieve this, what is most needed is a lot of common, ordinary horse sense. We suppose that if you don't have it, you just don't have it, and there is no use crying about it. In that case, your best bet is to go strictly by the book. But we strongly suspect that most traffic men have it all right—they just don't take the time to use it.

The other night, on one of our high-level NTS nets, we received a message carrying the check 25/26. Our contact wasn't very strong, and both QRM and QRN were bothering him. When the message was finished, we noticed that it contained only 25 words, according to our count, so we queried him. Nope, he stuck to 25/26. Well, in the QRM and QRN it was easily possible that we could have missed a short word somewhere, so we pursued the matter further. We gave him QTB and started QTing. Well, to make a long story short, he finally agreed to make the check just plain 25, but it was pretty obvious that he just wanted to settle the matter and thought we were making a big deal out of a trifle. We strongly suspect, also, that he didn't know what QTB meant (do you?).

True, the message made sense the way we had received it, but plenty of small words omitted can leave a message that still makes sense. Example: try omitting "not" from a message text and it will mean just the opposite of what is intended.

A lot of our traffic men who are real hep in other ways are awfully careless in their procedure. If the message comes in

If there was ever a station set up for traffic handling, W6PLG, manager of the Pacific Area Net of the National Traffic System, has it. Clem was stricken with pneumonia shortly after taking over as manager and landed in sick bay for a month or so, but is now back doing what comes naturally to amateurs of his calibre.

with a check of XX, it goes out that way. Wrong! Count the words (it can be done without any extra effort or time). If the form of the message is wrong, correct it before you send it out — but don't change the content. The parts of a message and the procedure that should be used in transmitting them are in the Operating Booklet. There is a reason for every rule, every recommended procedure, and that reason is to increase efficiency — that is, to make our traffic handling both accurate and fast. Neither is more important than the other, but both are of paramount importance! Fellows, let's start a drive against sloppiness. That's all it is, in most cases. It's just as efficient to be accurate; more so! You phone traffic men, get the marbles out of your mouth. You c.w. men, get control of your keys, especially those electronic monstrosities so many of you use. Let's make 1959 an era of efficient traffic handling.

Net Reports. W5ZIN reports the 7290 Kc. Traffic Net with 465 messages handled in 39 February sessions with 1363 check-ins. Hudson Traffic Net, per K1CIF, had 28 sessions, 351 check-ins and handled 546 messages. Early Bird Transcon Net, says W2KFFV, had 28 sessions and handled 896 messages. Slo Speed Net had 17 sessions, 65 check-ins, 109 messages. Sundown Traffic Net and Sundown Novice Net each had 28 sessions with QTC 84 and 15 and QNI 244 and 152 respectively. Transcontinental Phone Net handled 3450 messages in February. North Texas-Oklahoma Net had 29 sessions, 1031 check-ins and handled 253 messages.

National Traffic System. We're pleased that so many net controllers were given assistance by the ideas in this column in March QST. The pressure is on for us to get up a form of the kind we mentioned. Well, we asked for it.

Until such time as we get on the ball and accomplish this, here are some suggestions from the field in re possible improvements. K6HLR, RN6 Manager who got us started on this jag, suggests the possibility of using a punchboard made of plastic, to be used under the sheet we described in March QST. Little pegs could be punched right through the sheet and would stay there through any bumping. If you want to get real fancy, you could print the QNY data right on the backing board, and at each different net session merely fasten a strip of paper (with cellophane tape) over the part on which you would list reporting stations and their traffic lists.

Or, if you don't want to go to all this trouble (i.e., making the punchboard), you can use a piece of linoleum or heavy cardboard or plywood for backing, and instead of using the hex nuts suggested, use dress-maker or map pins — the kind with the round head on top. You can get these in different colors to differentiate between stations in the net, which may make spotting them even easier. Only trouble is, sometimes the heads pull off these pins. If this should happen when you are in the middle of a real scramble-net, you could be thrown into a panic!

W2RXL, manager of the New Jersey Net, says the system described is so much like the one he uses that I could have stolen it from him. (Go ahead, sue me!) He also recommends the use of roundhead pins instead of hex nuts, and he makes one more very excellent suggestion, just in case you netters think all this talk about how to control a net is not for you; that each net member "make like the NCS" on paper, just for practice. Some day even you may be called on to QNG, just when you least suspect it. Of course keeping an NCS record can be difficult when the NCS occasionally shunts you to a side frequency to clear traffic and you thus lose track of the proceedings, but the thought is a good one especially for those who start getting bored with not having any traffic to handle. Nothing like keeping busy.

Just one precaution about this: remember, there is only one net control station. If he asks for assistance, then be Johnny; otherwise, shaddap, even if you think he is lousing



things up. This latter isn't easy to do, and keeping an NCS record makes it even harder, but nothing is more exasperating to a net control than to have some Samaritan break in and give him the dope on what he ought to be doing instead of what he is doing.

February reports:

Net	Sessions	Traffic	Rate	Average session (%)	Representation (%)
1RN.....	28	772	.464	27.5	95.4 ¹
2RN.....	56	527	.400	9.6	97.0
3RN.....	56	513	.370	9.2	87.5
4RN.....	54	963	.455	17.8	59.8
RN5.....	56	911	.434	16.3	97.2
RN6.....	56	1266	.527	22.6	92.0
RN7.....	49	606	.296	12.4	44.4
9RN.....	50	1389	.764	27.7	79.0
TEN.....	82	1102	.522	13.4	70.9
ECN.....	36	110	.236	3.1	69.4
TWN.....	28	471	.397	16.8	75.0 ¹
EAN.....	23	1224	.978	53.2	99.3
CAN.....	28	1267	.873	45.2	100.0
PAN.....	28	1546	.827	55.2	100.0
Sections ² ...	921	8879		9.6	
TCC Eastern	67 ³	218			
TCC Central	28 ³	1213			
TCC Pacific	92 ³	1129			

Summary...	1521	24106	EAN	14.2	CAN/PAN
Record.....	1374	19708	1.001	19.1	100.0

¹ Regional net representation based on one session per day. Others are based on two or more sessions.

² Section nets reporting: NJN (N. J.); SMN (Md.); S. Dak. 40 Phone, S. Dak. 75 Phone, S. Dak. CW; SCN (S. C.); TLCN (Iowa); WSSN (Wis.); GSN (Ga.); WVN (W. Va.); CPN & CN (Conn.); SCN (Calif.); Minn. Noon Phone, Minn. Evening Phone; KMG & MSN (Minn.); HNN & CWXN (Colo.); Colo. Emerg. Fone; Tenn. Sect.; QMN (2 Mich. nets); NWFN, Gator, FMTN & FN (Fla.); KYN, KPN, Early KPN & MKPN (Ky.); VN (Va.); QKS (Kans.); AENP Morning, AENP Evening, AENO & AENB (Ala.).

³ TCC functions reported, not counted as net sessions.

The year 1958 was the best ever for NTS, and so far 1959 is even better. In '58, NTS nets and the TCC reported 233,344 message handlings, a gain of 30,000 over 1957. Over 2,000 more net sessions were reported, and 85 more reports were received. Data were up from '57 at all levels, and substantially so.

What pleases us most of all is that there now seem to be plenty of "takers" to fill managership vacancies. Where previously we had to beat the bushes for someone to take over a managership vacancy, now all a manager has to do is mention he'd like to resign and we get three or four letters from traffic men eager to take the job. This could be

surprising, because being an NTS net manager is no picnic, doesn't pay a thing, and no one bubbles over with gratitude for the job being done. But we're not surprised, because we know that the volunteers are proud of NTS and the part they play in it and are eager to do more to help make it even better.

Now comes the summertime with its QRN, diversionary weather, vacations and "daylight saving" time. This combination has always thrown the system for a loss, but in the fall it has always bounced right back, and even in the summer months the progress shown over the same month of the previous year has been right in step with overall progress. We want at this time, however, to enter our customary precaution: don't let the summer doldrums throw you. Don't forget your NTS commitments, but at the same time don't let this prevent you having a good summer. Now's the time when we can use all these eager volunteers to good advantage, so step up guys, and you'll be put to work.

W1BYR has issued 1RN certificates to K1z BUF GRP, W1z NJL OBR ROX and SMU. W2PHX is the new manager of 2RN, replacing K2RVH. W3UE reports that 3RN has a bunch of fine youngsters reporting in now. K6HLR puts out a complete summary sheet for RN6 every month. A 9RN certificate has been awarded to K9ISP. W0TOL changed his mind about resigning as TEN manager. W9DO, CAN manager, isn't a regular NCS of that net, but is almost always around, just in case; in February, he had to QNG only once. W0YHM reports again for W6PLG, PAN manager, but Clem is back in action now.

Transcontinental Corps. We would like to introduce our new PAN-TCC Director, W6EOT. Cecil has been handling TCC schedules for quite some time and knows what this TCC bit is all about. He replaces W6BPT, who wants a rest but does not intend to bow out altogether.

February reports:

Area	Func-tions	(%) Successful	Traffic	Out-of-Net Traffic
Eastern.....	67	88.1	1456	218
Central.....	28	78.6	1568	1213
Pacific.....	92	94.6	2155	1129
Summary...	187	89.8	5179	2500

WIAW SUMMER SCHEDULE

(Effective April 26, 1959)

(All times given are Eastern Daylight Saving Time)
Operating-Visiting Hours:

Monday through Friday: 1300-0100 (following day).
Saturday: 1900-0230 (Sunday). Sunday: 1500-2230.

Exception: WIAW will be closed from 0100 May 29 to 1900 May 30 in observance of Memorial Day.

A map showing how to get from main highways (or from Hq. office) to WIAW will be sent to amateurs advising their intention to visit the station.

Official ARRL Bulletin Schedule: Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules.

Frequencies (kc.):

C.w.: 1820, 3555, 7080, 14,100, 21,075, 28,080, 50,900, 145,600.

Phone: 1820, 3945, 7255, 14,280*, 21,330, 29,000, 50,900, 145,600.

Frequencies may vary slightly from round figures given; they are to assist in finding the WIAW signal, not for exact calibration purposes.

Times:

Sunday through Friday, 2000 by c.w., 2100 by phone.

Monday through Saturday, 2330 by phone, 2400 by c.w.

General Operation: Use the chart on facing page for times and frequencies for WIAW general contact with any amateur. Note that since the schedule is organized in EDST, the operation between 0000 and 0100 each day will fall in the evening of the previous day in western time zones.

Code-Proficiency Program: Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and at 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday are made on the above-listed frequencies (except 1820 kc.). Code practice starts at 2130 each day. Approximately 10 minutes' practice is given at each speed. On May 19 and 22 and June 17, instead of the regular code practice, WIAW will transmit certificate qualifying runs and a frequency measuring test.

*Single sideband.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for February traffic:

Call	Orto.	Recd.	Rel.	Del.	Total
W3CUL.....	278	1901	1396	494	4069
W2KEB.....	220	1836	1352	279	3687
W0BDR.....	10	1383	1265	27	2865
W4PL.....	33	866	841	19	1759
W8UPH.....	12	740	703	20	1475
W9LOG.....	31	653	665	20	1369
K1ZALZ.....	0	632	651	0	1303
W0IA.....	4	622	612	9	1277
W9DO.....	18	570	113	475	1176
W0LXC.....	30	565	543	22	1160
W0SCA.....	14	551	549	2	1116
K2UTV.....	27	537	520	17	1101
K1BCS.....	141	486	443	23	1093
W9JOZ.....	28	546	491	26	1091
K2GHR.....	4	498	312	9	1002
K4SJJ.....	37	531	470	28	1066
K00NK.....	164	428	498	10	1020
K2TEZ.....	197	422	202	181	1002
K2GWN.....	13	501	483	2	999
W6GOY.....	118	366	413	80	977
W6GVH.....	134	419	415	9	977
K5FGF.....	816	95	34	27	977
W5RPF.....	16	448	412	36	912
W4PFC.....	10	29	836	22	897
W9NZZ.....	246	313	313	0	872
K1CIZ.....	163	381	298	21	863
W6EOT.....	5	420	389	44	858
K2M30.....	30	414	374	23	823
K4ELG.....	18	400	382	23	823
K2SHL.....	13	370	350	22	755
K4EZL.....	36	361	328	11	736
W7PGY.....	23	349	314	31	717
W9IDA.....	10	353	352	1	716
W6CG.....	2	344	327	17	690
W5DWL.....	6	347	257	67	677
W0KQD.....	38	315	277	32	662
W00ME/5.....	28	315	309	6	658
K0DCW.....	324	322	2	2	650
K6DYX.....	1	308	304	32	645
W4TKS.....	642	0	0	0	642
W7ZB.....	11	319	296	26	642
K6LYC.....	31	307	293	8	639
K6WQW.....	0	309	268	0	618
K4QES.....	190	211	208	7	616
K0KRD.....	35	289	287	1	612
K6TVV.....	32	293	271	14	610
K4TBR.....	16	285	274	11	586
W9DYG.....	20	284	238	44	586
K4KCP.....	9	295	273	0	577
W18MU.....	18	282	314	27	569
W0PZO.....	5	288	261	11	565
W5CEZ.....	16	288	210	33	547
K3WBJ.....	49	245	89	156	539
W5DXI.....	2	268	263	5	538
K5PIS.....	6	267	257	6	536
W8DAE.....	57	235	110	134	536
W7BDU.....	7	266	260	250	532
W4GXR.....	14	258	227	31	530
W0CPL.....	17	267	222	17	523
K4OJD.....	42	242	228	2	514
K4GAT.....	3	269	227	2	511
K5OEA.....	20	247	222	20	509
K1BYL.....	8	250	245	1	504

Lat Reports:

W4PL (Dec.)..... 12 416 390 9 827

W6GOY (Jan.)..... 95 171 208 59 533

W9IDA (Jan.)..... 14 246 238 8 506

More-Than-One-Operator Stations

Call	Orto.	Recd.	Rel.	Del.	Total
K4WCZ.....	60	937	787	12	1796
K5WSP.....	62	788	780	8	1638
W4PFC.....	13	437	429	8	887
KLZCP.....	674	0	0	0	674
KG1DT.....	157	175	33	140	505

Lat Reports:

W6ZJB (Jan.)..... 299 559 377 22 1257

W4PFC (Jan.)..... 6 259 245 3 513

BPL for 100 or more organizations-plus-delirious

W4SHJ 289	K4QER 112	K0ARF 105
W4QDY 254	W7APS 110	K0JPJ 105
K4QLG 252	K6GZ 109	K1CMS 102
W9RON 205	K8JEF 109	W1ETU 102
W9DGA 161	K9IXD 109	W3UTU 102
W9JFR 157	K4UCS 108	WV2ATC 101
W9PQC 147	K2QHW 107	WV2AYI 101
K1JAD 128	K2VVL 107	W3TN 101
W9OFR 128	K3AHT 106	Lat Reports:
K5RYS 121	W2RUF 105	K4LLB (Dec.) 231
K288X 113	W0ANA 105	W9PCQ (Jan.) 111

More-Than-One-Operator Stations

WIAW 117

BPL medallions (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs since last month's listing: K280W, K4QER, W4SRK, K9KBD.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to the SCM a message total of 500 or more or 100 or more organizations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.



A "hot message" comes in during a drill of the Concord (Mass.) RACES group on June 12. Eighteen amateurs participated in a two-hour drill on 10, 6 and 2 meters. That's EC-RO W1WNP tuning the receiver in the back, and around the receiver clockwise are KNIGGS, K1BRO and K1CDN. W1LWZ was there too, but somebody had to take the picture.

TRAINING AIDS ADDITION

The ARRL Training Aids section announces the addition of a new slide collection entitled "Story of DX," and ARRL coded, SC-5. This is a historical collection of color slides (35 mm.) accompanied by hi-fi magnetic sound tape covering the history of DX (and coinciding with the slides) between the years 1921 and 1957. The show provides fine ham entertainment for everyone, and lends one an opportunity to see station layouts from the earliest to modern day. Don't miss this one!

We expect tight bookings on SC-5, and, as in the past, we ask that clubs give us plenty of leeway in requesting it. We have only one copy, but will do our best to satisfy all bona fide requests.

Special thanks is again given the members and associates of the Antique Wireless Association, whose main objective, to "preserve, restore and document" the early history of wireless, has indeed been evidenced by the fine slide collections they have produced in the past.

ARRL also maintains "The First Thirty Years of Amateur Radio," (coded SC-4), another excellent by-product of A.W.A. This too, is available to all affiliated clubs.

SUPPLEMENT TO NET DIRECTORY

The following list of nets will supplement and correct the listing on page 91, Nov. QST; page 89, Jan. QST; and page 84, Mar. QST. Only those nets devoted to an emergency or traffic purpose are listed. This brings the records up to date as of March 17, 1959. Since these additions and changes were made subsequent to publication of the master net directory (CD-50), they can be used to amend your copy of the directory. An asterisk (*) indicates correction from one or more of the above-mentioned listings; otherwise, the net is new for the 1958-59 season. This is the last QST net supplement before fall re-registration. All nets must be re-registered after August 1.

Important note: ARRL lists of nets are for information only. They do not carry any official significance. Nets are registered as closely as possible in accordance with information given by the registrant.

Name of Net	Freq.	Time	Days
Arctic Amateur Net	3866.5	1830 AST	Mon.-Fri.
Cape Cod Novice Net (CCNN) (Mass.)	3707	1400 EST	Sat.
Fond du Lac (Fox River Valley) 6 Meter Emerg. Net	50,100	2100 CST	Mon., Wed.
High Noon Net (Detroit Mike and key club)	3820	1200 EST	Daily
Kansas Slow Speed Net (QKS SS)	3610	1930 CST	Sun., Tue., Thurs., Sat.
Manitoba Phone Net	3760	1245 CST 1900 CST	Daily
Mike Farad Traffic Net (MFD)*	7239	1200 EST	Mon.-Fri.
Minn. Jr. Net (MJN)*	3690	1700 CST	Mon.-Fri.
Nevada Net (NVN)	7106	1700 PST	Mon., Wed., Thurs.
N. J. Slow Speed Net (NJSS)*	3748	1806 EST	Mon.-Fri.
N. M. AREC Net (NM AREC)	3980	1900 MST	Tue.-Sat.
North Ala 6 meter Net (AEN-O)	50,550	1915 CST	Mon., Wed., Fri.
Northeast VHF Net*	145,800	2000 EST	Daily
Northwest Tenn. Emerg. Net	3820	1400 CST	Sun.
Peanut Whistle Net	3850	0830 PST	Mon.-Fri.
Sangamon County AREC Net (Ill.)	3877	1330 CST 1900 CST	Sun. Thurs.
Slow Speed Net (SSN)	3703	1915 CST	Daily
So. Ill. Emerg. Net (SIN)	3875	1730 CST	Mon., Fri.
Tenn. Teen-Age Net (TTAN)	3980	1730 EST 1630 EST	M., W., Fri. Sun.
Trans Continental Relay Net (TCRN 4)*	3521	2200 GMT	Daily

W1AW GENERAL-CONTACT SCHEDULE

(In Effect April 26, 1959)

W1AW welcomes calls from any amateur station. Starting April 26, W1AW will listen for calls in accordance with the following time-frequency chart.

Time (EDST)	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
0000-0100 ¹	.....	.....	3555 ³	.....	3945	7080 ³	.....
1300-1400 ²	.....	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	.....
1500-1600	.....	7080	14,100	7255	14,100	7080	.....
1600-1700	.....	14,280	7080	14,100	14,280	14,100	.....
1800-1900	.....	14,280	14,280	14,280	14,100	7255	.....
1900-1930	.....	7255	.....	21,075 ³	.....	14,280	.....
1930-2000	.....	14,100	.....	3555	.....	14,280	.....
2000-2030 ¹	14,280	3555 ³	14,100	14,100	7080 ³	14,100	.....
2030-2100	14,280	3555	14,100	14,100	7080	.....	.....
2100-2130 ¹	145.6 Mc.	21,330	145.6 Mc.	50.9 Mc.	21,330	.....	.....
2230-2300	.....	.....	1820	.....	1820	.....	.....
2300-2330	.....	.....	3555	.....	3945	.....	.....
2330-2400 ¹	.....	3945	7255	3945	7255	3945	.....

¹ Starting time is approximate. General-contact period on stated frequency begins immediately following transmission of Official Bulletin, on c.w. at 0000 and 2000, on phone at 2100 and 2330.

² Operation will be on 21,075, 21,330, 28,080 or 29,000 kc., depending on band and other conditions.

³ W1AW will listen for Novice Class licensees on the Novice portion of this band before looking for other contacts.



Denver area EC W0LO hooks up the coax to the Denver Radio Club station, W0LOU. The club opened the station recently as control for Denver area AREC and RACES. Equipment was donated, begged, borrowed and built. Quarters are provided rent-free by the Denver Red Cross, which has the best 10-meter location in the city.

HIGH SPEED CODE WINNERS

Although copy is still being received, so far the following winners have been announced in the WINJM high speed code test transmitted on March 15 (see p. 80, March 1959, QST): 55 w.p.m., W1KYK, W1ZDP, W5JPC, W9BRD; 50 w.p.m., W3GJY, W4ZKU, KN4VUR, VE7CQ; 45 w.p.m., K2KIR, W8ZCW, W9YZO, K9ILM; 40 w.p.m., W1WPR, K2ACP, W2LYH, W2ZVW, K4CAX, W4LYV, W4ORB, W4YE, W7LVU, W8APL, W8DQG. Each has been awarded a club code proficiency certificate by the Connecticut Wireless Assn., Inc.

Honesty can be a heart-rending business. Some of those who failed to make the grade came so close that the temptation was there to stretch a point; but, "get thee behind me, Satan!" The following get an A for effort: W1FPS, W2CQB, W2CVW, K2QBW, W3AHX, K4ELG, W8YCP, K9DJM, K9DJN, K6BHM, KH6BSY/1, KH6CDC/1, VE3ATR.

WINJM says there will probably be another high speed test in the fall — no date set as yet. Meanwhile, the high speed code practice continues Sunday evenings at 2030 EST. This will not change to "daylight saving" time.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying in from WIAW will be made May 19 at 2130 Eastern Daylight Time. Identical texts will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,600 kc. The next qualifying run from W6OWP only will be transmitted May 7 at 2100 PDST on 3590 and 7128 kc.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from WIAW each evening at 2130 EDST. Approximately 10 minutes' practice is given at each speed. Reference to texts used on several of

the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of QST text sometimes is reversed. To improve your fist, hook up your own key and audio oscillator and attempt to send in step with WIAW.

Date Subject of Practice Text from March QST

- May 1: A Hybrid Communications Receiver, p. 19
- May 5: The "K4HWY Special" Antenna, p. 24
- May 11: . . . VHF and UHF Reception, p. 35
- May 14: Complete Civil Defense System . . . , p. 48
- May 21: Magic Mountain to Malibu, p. 50
- May 26: My First SS, p. 62
- May 27: The Big Thrill, p. 166

RTTY NOTES

The RTTY Society of Southern California announces these first returns, based on logs received by March 9, on its 6th Anniversary RTTY Sweepstakes of February 13 and 14. W0BP appears to have topped all entrants with 96 contacts, 44 sections, and a score of 8448. Runner-up was W3PYW and 94 QSOs, a 42 multiplier, 7854 points. Others scoring over 1000 points were: W2TKO 6396, KH6LJ 4292, W5YM 3968, W6AEE 2880, W8FEU 2214, W8CRY 2208, W9BMV 2162, W7LPM 1872, W1BGW 1848, W8LJV 1794, W8CAT 1449, W0FQW 1344, KL7ALZ 1080, W1a AW GNS MB RMH WEW, K2HHH, W3a CRO MHD, W4EHU, W5TVG, W6a AAN GDO OGG ZNU, K6ZBL, W7a HRC IE JMH PQJ, W8a LEX NIY RTZ, W9a COW ROQ YT, K9BRL, W0a AJL ITX JHS LFH TOB YMB, KR6AK, VE6UB, VE7EP, and VK3KF were also reported active in the winter beedle-beedle contest.

Late word on New Zealand RTTY regulations comes via ZL1WB. As of March 4, 1959, ZL amateurs may use zero to 850 cycle f.s.k. in the lowest 50 kc. of the 3.5 and 7 Mc. bands and in the first 100 kc. of the 14, 21, and 28 Mc. bands.

RESULTS, JANUARY CD PATRIES

The highest claimed scores follow. Figures after each call indicate score, number of contacts and number of different ARRL sections worked. Final and complete results appeared in the April CD Bulletin.

C.W

K6SXA.....209,300-592-70	W3ZHQ...123,600-407-60
W1TYQ...205,530-656-62	W9NLJ...121,510-413-58
W1PUO...200,850-611-65	W2DRV...121,245-404-59
W3GRF...199,680-618-64	W4AGP...120,590-382-62
W9MAK...185,590-547-67	W2MTA...120,360-403-59
W3KLA...185,535-589-63	W6ISQ...118,080-362-64
W6BES...182,650-555-65	W8NOH...115,500-380-60
K2PHF...173,880-545-62	K5BSZ...115,420-393-58
W0NYU...173,250-543-63	K9DWK...111,500-409-54
VE3BZB...156,465-509-61	W8TZO...109,430-346-62
K9ELT...154,500-511-61	K4IXG...108,950-340-62
K4CAX...153,450-552-55	K4DRO...108,580-350-61
W8IBX...152,960-473-64	W18MU...107,445-377-57
W4PNK...145,485-477-61	W1AW...105,315-350-59
W3DQG...143,500-496-57	K2MES...105,205-392-53
W2SZ...139,995-453-61	W9NH...105,050-376-55
W1ARR/6...138,775-420-65	W4BEZ...104,965-364-57
W3NF...136,290-455-59	W3WJ...103,880-388-53
W0BDR...134,815-457-59	W1ECH...103,400-369-55
W3GYP...133,925-482-55	W8PBO...102,960-392-52
W1DGL...130,800-431-60	W4WKQ...102,870-381-54
W7VLU...127,360-393-64	K0IDV...102,600-375-54
W9LNQ...126,300-416-60	K8DEY...100,500-330-60
K5JCC...124,785-418-59	W4KFC...100,440-317-62
W1JTD...124,620-395-62	W4ZM...100,440-319-62
K4BAL...123,830-421-58	K9AUE...100,920-344-58

PHONE

W1ECH...33,660-180-36	W8NOH...19,080-101-36
K2PHF...32,160-194-32	W0ALW...17,860-102-34
W1FYF...32,250-155-30	K1CAU...17,690-118-29
W9YT...22,035-107-39	K0IDV...15,300-97-30

W0ALW, Minnesota OPS, averts the January Phone CD Party was definitely the best one yet. Chuck's 17,860 points and 102 contacts was tops for W0 and sixth nationally.



K1BEB.....15,120-123-24	K3ANS.....9765- 89-21
W1VW.....15,080-100-29	K2EUI.....9720- 75-24
W3NF.....14,715-102-27	K1BCS.....9120- 70-24
K9ALP.....14,100- 94-30	W4LK.....9085- 79-23
W0TUS.....12,035- 83-29	K0LYV.....8680- 60-28
W2COB.....11,880-108-22	K0EWC.....8640- 72-24
W3MSR.....11,385- 92-23	W2EFU.....8300- 77-20
W3CUL.....9960- 76-24	W1GKJ.....7800- 73-20

¹W1WEF, opr.; ²K3GUR, opr.; ³W4YZC, opr.; ⁴W1WPR, opr.; ⁵W9SZR, opr.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....292	ZL1HY.....284	W6GFE.....283
ZL2GX.....291	W6CQU.....284	W8BKP.....282
W6AM.....291	W9RBI.....284	W6ADP.....282
PY2CK.....289	W2KKT.....284	W9YBP.....282
W8HGW.....289	G2PLI.....283	W6EBG.....282
W3GHD.....289	W2BXA.....283	W7AMX.....282
KV4AA.....287	W1ME.....283	G4CP.....282
W4JNN.....286	W4JAM.....283	W6WV.....282
W6SYG.....286	W5DMD.....283	W7GUV.....281
W8HRA.....286	W6DZZ.....283	W5ADZ.....280
W5ASG.....286	W2HUQ.....283	W6T8A.....280
W5JIN.....286	W3BES.....283	W8KTA.....280
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Radiotelephone

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W8OZ.....280	W2RAC.....277	W6YY.....269
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From February 1, to March 1, 1959 DXCC certificates and endorsements based on postcard contacts with 100 or more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

W1HZ.....223	VE3DCI.....106	K6IXS.....101
K4G8U.....210	W2RAC.....105	W7FEG.....101
K2OPJ.....161	W3JW.....105	W8DWP.....101
W8MCC.....149	K9GVE.....105	K8GHG.....101
W4IBB.....146	K9HJ.....105	W9WAN.....101
K8REU.....143	FO1BD.....105	EA1CP.....101
IDV.....134	G3ISX.....104	K2LPI.....100
DJ1KR.....126	SM2CAA.....104	W3HIB.....100
W0OBW.....123	W2ZCZ.....103	W3XQB.....100
K2VUI.....121	K6IEC.....103	K4BOM.....100
PA0XNM.....121	I1ZCN.....103	W4IEN.....100
K4EME.....120	OH2WW.....103	W4WSF.....100
K6LAE.....119	YT308.....103	K6RTU.....100
OA4FM.....114	W6UDR.....102	W1MC.....100
OH3UN.....114	W7LOB.....102	W6MFP.....100
K0HEA.....111	W7ZAS.....102	K6VKS.....100
K4BCN.....110	W9UTH.....102	W8OTT.....100
W4TVQ.....110	W9WUF.....102	K9AVQ.....100
K3BQB.....109	ET3GB.....102	W9UTV.....100
W6JH.....108	LU4HU.....102	W9WML.....100
W2PVP.....107	PJ2CJ.....102	KP4RK.....100
JA1BF.....106	K4SRX.....101	ZK2AD.....100
	K6BX.....101	

Radiotelephone

W4IBB.....119	W0OBW.....110	W9JIV.....102
W8RHO.....118	K4BCN.....107	Y8JR.....102
W9WKU.....115	K4LPW.....106	W9FVU.....101
W6AMR.....113	K8PCK.....106	W12SU.....101
W6QFE.....111	OK1FF.....105	W4FAH.....100
IDV.....111	K9EQU.....104	W0UIM.....100
W6GUE.....110	K8CFU.....103	VE3DYB.....100
	EA1CW.....103	

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W1TW.....270	W2BYP.....242	W2EMW.....220
W6NTR.....270	W6NGA.....241	W2IRV.....220
OK1ER.....263	W6PH.....240	W1BLO.....218
W8EWS.....262	I1SM.....240	W3LMM.....218
W3KDP.....260	W2AYJ.....238	W0SYK.....216
W9ABA.....260	W2HQL.....238	K9BYR.....215
W5AFX.....255	W2HBE.....232	K6EC.....213
W6YMD.....255	W7HIA.....232	W7AUS.....213
W7ADS.....253	CO2SW.....232	W9TQL.....213
W8NUC.....253	ON4NC.....231	W9WCU.....213
W6QNA.....252	ON4PA.....230	W21EU.....212
W3OP.....250	W1VG.....223	W1BFT.....210
W6EFR.....250	W2AEB.....221	W2LSX.....210
W2DEC.....247	W6LTX.....221	W9RKP.....210
W6CHV.....243	KP4CC.....221	W2ESO.....202

K4LPW.....202	W4COC.....169	K6GLC.....134
W3GEN.....201	W6RAN.....169	W1ALK.....133
W4SRT.....201	W5BQJ.....163	W3EIS.....133
W6MEL.....201	CR7LU.....163	W9GGO.....133
W7DAA.....200	W00AQ.....162	W3IPG.....132
DL1GU.....200	DU7SV.....161	W4IKL.....132
D2BW.....200	W2VYN.....160	K2MIO.....131
W6UOV.....199	W3AYD.....160	W6HJ.....131
VE7MD.....198	W3ZAL.....160	W1EKO.....130
VE7VC.....198	K4DRO.....160	W1WKO.....130
W6FUF.....196	K6RWQ.....160	W3DDV.....130
W8BSY.....195	W7IAA.....159	W3IPO.....130
WINHJ.....194	VE3HB.....159	W4OMW.....130
W1JB.....193	SP5CK.....158	K6GCF.....130
KZ5WZ.....193	W1JSS.....153	W0DEI.....130
W9LI.....191	W1KXP.....151	W1UCA.....125
W3LEZ.....190	W0LIW.....150	W2EZY.....125
W4CXI.....190	ZL4CZ.....150	W6TMM.....125
W7FBD.....190	G5JU.....147	K2UPD.....123
DL1DX.....190	W8LQA.....146	W6GSE.....122
W1ICW.....182	W9LTR.....145	K6SNA.....122
K6EDE.....182	W0UXS.....144	K0RCK.....122
W8ONA.....182	W4BFR.....143	SM5AJR.....122
W1LQ.....180	K2IAD.....142	W1YXD.....121
W2FXA.....180	W3KA.....142	W4VOW.....121
W4XNW.....180	W0SNL.....142	G2KI.....121
W0AJU.....180	VE4DB.....142	W1NF.....120
SM3EP.....180	W1WHI.....141	K2IRO.....120
W4JAT.....179	W1IUU.....140	K0HGB.....120
W4OPM.....175	K6GLC.....141	K2ZAA.....120
W9HKL.....175	K0GXP.....141	W6JFV.....120
W3BQA.....172	W2FLD.....140	W9UMJ.....120
K0DMY.....172	W2NLY.....140	K0HGB.....120
HB9NU.....171	W2STJ.....140	G3JHZ.....120
K6HWW.....171	K4IEN.....140	K6HDKA.....120
W2CJG.....170	K4LTA.....140	K4LTA.....114
W4COC.....170	K6OXU.....140	K4DRK.....112
VE1HG.....170	W9ROK.....140	DL6OS.....112
VE3IR.....170	W4LHT.....137	V5PBL.....112
G6GHI.....170	W4PLL.....136	W5NFX.....110
SM5KM.....170	F3ZU.....136	K8CVQ.....110
	K6CTV.....135	

Radiotelephone

CO2BL.....243	W7AUS.....163	W9LTR.....136
W9WHM.....240	W4CWV.....162	W8BSY.....135
W9YSX.....223	W0QVZ.....161	W7DAA.....133
W7HIA.....220	W1LLF.....160	W1BHI.....132
CT1PK.....220	W8HBI.....160	W4PHL.....131
W7ADS.....210	G2MI.....160	W8GUTZ.....131
W4ADY.....206	W3GEN.....156	W9UCZ.....130
W5GXP.....202	W0FUH.....151	W6YMD.....127
W3VU.....201	W1JSS.....150	SA1TB.....125
OZ7FG.....200	W1KRS.....150	W3OGR.....121
W6CHV.....196	W3FWD.....150	W3MS.....120
W0JFW.....194	W5HWX.....148	FSVU.....113
W3MAC.....192	SM3EP.....147	W2GRU.....112
W2JY.....191	W3HCO.....142	W3BNC.....112
ZS1DO.....190	I1BRN.....142	W6YK.....112
W5HZE.....179	K5BUE.....141	CT1HE.....111
W2AEB.....171	W2DEC.....140	W1SIO.....110
W1GKK.....170	DL1WP.....140	K1DRN.....110
W8SYK.....170	PY7VE.....140	W6NFX.....110
HB9NU.....170	W5BQJ.....139	K9GUM.....110
	W6MEL.....138	

U.S.-Canada Area and Continental Leaders

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W4TM.....276	VE3DF.....212	VE7ZM.....265
W6ELA.....272	VE4XO.....180	VE8AW.....195
KL7PI.....202	VE5RU.....163	VO1DX.....199
VE1EP.....220		4X4DK.....267

Radiotelephone

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W4HA.....239	VE1NH.....122	VE6TF.....123
W5BGP.....241	VE2WW.....176	VE7ZM.....265
W7PHO.....235	VE3KF.....224	G2PL.....297
W8AIV.....233	VE4RP.....102	4X4DK.....266

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM. Richard B. Mesurov, W3JNQ—SEC: DVB, PAM: TEJ, RM: AXA. PEN meets on 3550 kc. Mon. through Fri. at 1800. The E. Pa. Net meets on 2610 kc. Mon. through Sun. at 1830. New appointments: K3ANS as OO, OBS and ORS. BJG is on 50 and 144 Mc. from KH6-Land. K3CVF is on with a 180-watt rig on 6 meters and ZMC is on 80 through 10 meters with the same power. K3AFW is on 420-Mc. TV with a home-brew camera. DVB has a new triband vertical for 40 through 10 meters. His XYL passed the Novice Class exam. K3CTC enlisted in the Air Force and left for Texas Mar. 6. ZRQ lost an antenna during a snowstorm but has it working again. K3DZN installed a TR switch and is now operating break-in. K3ALD operated in the DX Test. AXA still needs outlets in Reading and Lebanon for the E. Pa. Net. Please contact the RM or SCM. HNK received a WWCNY Award and sent in QSLs for the Keystone Award. K3ETL and K3DNT dropped the "N" from their calls. K3ALL received his WAC. The new radio club at the E. Stroudsburg H.S. received the call K3HOD. Prexy is ZIV. K3ANU entered the NR and DX Test. KUJ is working lots of DX on 80 meters. UEU has moved to W. Pittston, out of E. Pa. The Carbon Co. Net meets Mon. and Thurs. on 145.380 Mc. at 2000. All stations are welcome. UIU made the BPL on deliveries, and received WDEL certificate No. 257. K3ANS received Keystone Award No. 38. K3AHT received his 30-w.p.m. code sticker and made the BPL on deliveries. EU has another grandson, FKE. K3AOX, K3AQG and K3HPO won first prize at the Boy Scout Adventurama sponsored by the Bethlehem Council of Boy Scouts. CUL's traffic total was boosted by three fairs: Mae now has a complete kw. station composed of Halliarafter equipment. K3ASH has been accepted at Muhlenburg and will study E.E. K3ERY and ZXY have new YL jr. operators. JSA is on 6 meters. The North Penn. RC will hold its Club Family Night Dinner May 16. GTC and EQZ represented the North Penn. Club at the Delaware Valley convocation held at WCAU. VST has a pair of mobile Gonset "twins." General N. D. Cota addressed the Montgomery Co. RACES Feb. 13. FCI is QRL with school work. EAN blew the modulation transformer in his Apache, but is on c.w. Traffic: (Feb.) W3CUL 4069, K3AHT 369, W3UIU 245, K3ANU 64, W3TEJ 76, ZRQ 74, K3DZN 71, W3AXA 67, WIP 64, K3ANS 54, W3DVB 54, K3ASH 43, W3FKE 31, BNR 30, AMC 18, ELI 16, NQB 16, ZLP 16, K3ALD 15, W3BFF 14, HNK 7, CNO 4, MET 4, FCI 3, ADE 2, KF 12, KJJ 2, PUY 1. (Jan.) K3ANS 54, DFB 36, W3MJM 24, TEJ 13, LHA 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM. Louis T. Cronberger, W3ICR—Asst. SCM for Delaware: Ray de Clurelle, 310QZ, SEC: YVB. New appointments: K3BBV and K3CRQ as OOs. Section nets: MDD, M-8, 1915 EST; MEPN, 3820 kc. MWF 1830, SS 1300 EDT; DELEN, 3905 kc., 1830; M6MEN, 50.25 Mc. Wed. 2100. The new ham club at Ft. Meade is known as the Free State Amateur Radio Club. Officers are NNM, pres.; IPO, vice-pres.; EBF, secy.-treas.; and K3CJW, supply officer. OBR was guest speaker at the Mar. 2 meeting. The B&O ARC had another nice write-up in the B&O Magazine. PZK spoke on "How to Convert a 522 Transmitter" at the RCARA meeting Feb. 13. K3CJM spoke on "The Use of the Oscilloscope in the Ham Shack" at the Feb. 27 meeting. The final report of the 10th ARRL National Convention has been released by the Foundation of Radio Amateur

Clubs. The work was headed up by OMN, with NL, PZZ, K4LMB, the XYLs of OMN and PZZ, the executive committee, and others assisting. The foundation officers are PRL, pres.; YVB, 1st vice-pres.; ECP, 2nd vice-pres.; RE, treas.; and K4MFE, secy. The NCVHF's new officers are OJU, pres.; K4RFR, vice-pres.; and K4SYP, secy.-treas. MADD net certificates have been earned by EEB, HXN and K3GPN. KDC, of Cumberland, is a radio operator on the USS English. RDZ reports for duty on the USS Roan and K3GXB, of Port Deposit, is RMC on the USS Haley, presently at Cuba. BVL reports that HWU has earned B&O certificate No. 2. The AARC did some fine emergency work with local officials in providing communications in search of a 3-year-old, EDA had write-ups in the *Herald Mail* (Hagerstown daily) on Jan. 27 and Feb. 7. EPV has showed up on an AN on phone. K3WBJ and TN made BPL again. JME reports the BCEN had nice write-ups in the local papers. IWJ of the Kunz family, reports he is handling traffic on 2-meter i.c.w. and the family has a new 6-meter beam. It is with mixed emotions that I write this final column. Much was planned during my term as your SCM, some has been accomplished, but more remains to be done. It is a rare occasion that the SCM has the opportunity of being an active participant in a National Convention, as was my pleasure. The cooperation that I received was tremendous. It was my desire and still is to visit as many of the clubs and meet as many amateurs of the section as possible. During the first 18 months I feel that this was accomplished; however, in Oct. of '58 I was transferred to the Navy at Portsmouth, Va., and this precluded any planned travel. Since then I have not been as active in section affairs as I desired. It is thus that I leave the MDD to a new SCM who I am sure will be able to be more active than I have been. It is with reluctance that I leave with so much to be accomplished, but again with a feeling of relief that the members of the MDD can now have the type of representation they deserve. Your new SCM has a big task before him. He deserves and needs your cooperation in order to accomplish only a small part of the huge task. He needs your club bulletins and meeting notices as well as news of your membership so he can write a balanced column. Every club should put the SCM on its mailing list for all club information. I would like to thank the many individuals, nets and clubs who assisted me and made my job easier as your SCM. Traffic: (Feb.) K3WBJ 539, W3UE 358, MCG 221, CWF 152, TN 134, QCW 112, BUD 96, NNM 78, PQ 56, AHQ 54, IWJ 34, DAG 30, WSE 12, CN 9, JZY 2, OYX 2. (Jan.) W3NNM 180, IWJ 17.

SOUTHERN NEW JERSEY—SCM. Herbert C. Brooks, K2RB—Sec: W2YRW, RMs: W2BZJ, W2HDW, W2YRW and W2ZJ. Appointment this month—K2YBN. Levittown is a new Official Observer. The Gloucester County Radio Club elected the following officers: W2KE, pres.; K2AQL, vice-pres.; W2IOZ, treas.; K2JJC, secy. Meetings are being held in Glassboro, NJ 75-Meter Phone Net certificates have been issued to K2YBV Northfield, K2CJB Bridgeton, K2DVE Villaville and W2OWC Salem. W2RG, Merchantville, has built a new QRP transistor transmitter and receiver, K2JGU, Glassboro, has a new antenna. W2ZJ, Trenton, is back on the air at his new QTH. W2RAY, Haddonfield, has been monitoring the satellites. Mercer County RACES and State C.D. were hosts to the Army Reserves, demonstrating their RACES equipment and net procedure. K2BNS, reporting Burlington S.W. Radio Club activities, advises a new antenna has been added. W2BEI, Audubon, is back handling traffic after several years of inactivity. W2BLV was the SJRA's top scorer in the recent V.H.F. Contest. Brothers Joe and Hal, K2ITP and K2ITQ, did outstanding work in the same contest. With regret we report the passing of W2QEG, W2RXL, NJN Mgr., reports a February traffic total of 346. W2RXL issued a fine monthly net bulletin. W2TE is the SJRA's top DXer with 221 worked. K2OE and W2ZX also have over 200. W2ZAS is Radio Officer of Haddon Heights and Camden. K2SOL, Gloucester Co. EC, is back in business after a serious illness. Traffic: (Feb.) K2DEI 175, W2ERG 130, W2BZJ 110, K2JGU 86, W2ZJ 16. (Jan.) K2DEI 148.

WESTERN NEW YORK—SCM. Charles T. Hansen, K2HUK—SEC: W2GBX, RMs: W2RUF and W2ZRC. PAMs: W2PVI and W2LXE (v.h.f.). NYS C.W. meets on 3615 kc. at 1800, ESS on 3590 kc. at 1800, NYSPTEN on

(Continued on page 124)

AN ULTRA-STABLE, LINEAR V.F.O.

IN THE COURSE of our extensive development project on the FPM-200, which is being readied for fall production, many interesting sub-assemblies of the completed unit have emerged from the lab.

ONE SUCH MODULE is the transistorized, permeability-tuned oscillator. This unit, which employs conventional Colpitts circuitry, and covers 500 kc. from 8.25 to 8.75 mc., provides virtually drift-free frequency control, combined with calibration accurate to less than 1 kc across its operating range.

THE UNIT TAKES advantage of the fact that transistors, in such an application, generate essentially no heat. Thus the only drift which must be compensated for stems from changes in outside temperature and voltage variations.

CONVENTIONAL capacity temperature compensation effectively solves the problem of outside temperature variations. Minute voltage changes, which may come from the regulated voltage source, are compensated for in a unique varicap bridge circuit. This voltage sensitive semi-conductor supplies a change in capacity which corrects for frequency fluctuations as the applied voltage is varied.

LINEARITY IS ASSURED by precision winding the variable pitch inductor and careful selection of the powdered iron slugs which tune the inductance. Naturally, the drive mechanism must be accurately machined.

THE OSCILLATOR is a 2N371 drift transistor, operated grounded base, the equivalent of grounded grid in vacuum tube circuitry. This stage is followed by a 2N371 buffer which provides $\frac{1}{4}$ milliwatt output, sufficient for receiver frequency control. For transmitter applications, additional amplification will usually be necessary.

OTHER NEW DEVELOPMENTS resulting from FPM-200 research will follow on this page.

— TOM STUART, WØREP

Paul Ballou Jr. W. J. Healy W9AC for Hallicrafters

CONTEST OPERATOR...OR "RAG-CHEWER"...THEY'LL ALL TELL YOU

Viking transmitters

Yes, dollar-for-dollar and feature-for-feature you'll get more of everything in a Viking transmitter... that's why Viking transmitters out-sell all others! Write for your free Viking Amateur Catalog and you'll soon see why your best transmitter buy is a Viking!

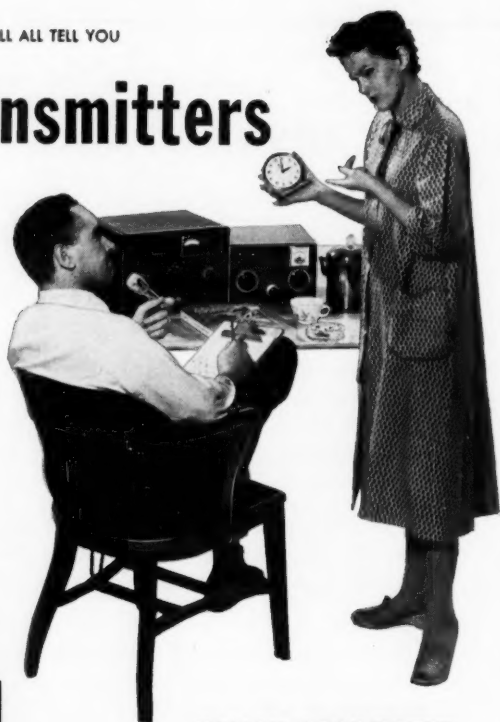


NEW!

**Crystal-controlled—
instant bandswitching
6 and 2 meters—available
in 4 output ranges!**

**WRITE FOR DATA SHEET 711 — LISTING
FREQUENCY RANGES AND RECEIVER
CROSS-REFERENCE CHART.**

Catalog Number	Range	Amateur Net
250-43-1...Kit	26 to 30 mcs.	\$59.95
250-43-2...Kit	28 to 30 mcs.	\$59.95
250-43-3...Kit	14 to 18 mcs.	\$59.95
250-43-4...Kit	30.5 to 34.5 mcs.	\$59.95
250-43-12...Wired	26 to 30 mcs.	\$89.95
250-43-22...Wired	28 to 30 mcs.	\$89.95
250-43-32...Wired	14 to 18 mcs.	\$89.95
250-43-42...Wired	30.5 to 34.5 mcs.	\$89.95



"6N2" CONVERTER

**Maximum Sensitivity! Low Noise Figure!
Excellent Image and IF Rejection!**

Compact... complete with self-contained power supply, this new Viking "6N2" Converter is instant bandswitching... converts 6 and 2 meter signals to your choice of 4 receiver ranges! (Data sheet No. 711 lists ranges and complete receiver cross-reference guide.) Utilizes the new 6ES8 dual triode with "frame grid" construction in a Cascode RF amplifier circuit... tube transconductance, 12,500 micro-mhos per section. High frequency overtone crystals in series mode operation produce outstanding oscillator stability—eliminating the multiplicity of sum and difference frequencies. Advanced IF amplifier design with a grounded cathode stage and a low plate resistance value insures stable operation and an effective impedance match to 50 or 75 ohm output coaxial cable. Silver-plated chassis and three silver-plated interstage shields. Available completely wired and tested or as an easy-to-assemble kit.

*Watch for more
exciting new Johnson
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"KILOWATT" AMPLIFIER

Here's the most exciting unit you've ever seen . . . the unit that puts the whole world at your fingertips! Brilliantly designed and engineered, the Viking "Kilowatt" is the only power amplifier available which will deliver full 2000 watts SSB* input and 1000 watts CW and AM! Continuous coverage 3.5 to 30 mc. Excitation requirements: 30 watts RF and 10 watts audio for AM; 10 watts peak for SSB.

Cat. No. 240-1000 . . . Wired and tested . . . \$1595.00 Amateur Net
Cat. No. 251-101-1 . . . Matching top, back and pedestal . . . FOB Corry, Pa.
\$132.00 Amateur Net

*The FCC permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of 2000 watts or more depending upon individual voice characteristics.

"PACEMAKER" TRANSMITTER/EXCITER

An outstanding power bargain when used as a transmitter or exciter! 90 watts SSB P.E.P. and CW input . . . 35 watts AM. Highly stable built-in VFO. Instant band-switching 80, 40, 20, 15 and 10 meters. VOX and anti-trip circuits. Wide range pi-network output. Effectively TVI suppressed. With tubes and crystals.

Cat. No. 240-301-2 . . . Wired . . . \$495.00 Amateur Net

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FIRST CHOICE AMONG THE NATION'S AMATEURS

WASECA, MINNESOTA



"COURIER" AMPLIFIER

This power-packed Class B linear amplifier is rated 500 watts P.E.P. input with aux. SSB exciter - 500 watts CW and 200 watts AM! Continuous coverage 3.5 to 30 mcs. May be driven by the Viking "Ranger", "Pacemaker" or other unit of comparable output. Drive requirements: 5 to 35 watts. Employs two 811A triodes in parallel - wide range pi-network. TVI suppressed. With tubes.

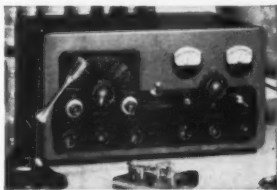
Cat. No. Amateur Net
240-352-1 . . . Kit . . . \$244.50
240-352-2 . . . Wired . . . \$289.50



"THUNDERBOLT" AMPLIFIER

Here's real power and peak performance in a compact desk-top amplifier. Rated 2000 watts P.E.P.* input SSB; 1000 watts CW; 800 watts AM linear! Continuous coverage 3.5 to 30 mcs. - instant band-switching. May be driven by the "Ranger", "Pacemaker" or other unit of comparable output. Two 4-400A tetrodes in parallel, bridge neutralized. Wide range pi-network output. With tubes.

Cat. No. Amateur Net
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"FIVE HUNDRED" TRANSMITTER

More than one-half kilowatt of power and operating convenience! 600 watts CW input . . . 500 watts phone and SSB (P.E.P. with auxiliary SSB exciter) - instant bandswitching 80 through 10 meters! All exciter stages ganged to VFO tuning. High gain push-to-talk audio system. Highly stable, built-in VFO or crystal control. Wide range pi-network output. Low level audio clipping - effectively TVI suppressed. With tubes, less crystals.

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240-500-2 . . . Wired . . . \$949.50

BUILD YOUR OWN



HAM GEAR



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IS DESIGNED BY HAMS
WHO KNOW YOUR
PROBLEMS AND
NEEDS.

PROVEN, "ON THE AIR"
PERFORMANCE



"SENECA" VHF HAM TRANSMITTER KIT

Beautifully styled and a top performer of highest quality throughout. The "Seneca" is a completely self-contained 6 and 2 meter transmitter featuring a built-in VFO for both 6 and 2 meters, and 4 switch-selected crystal positions, 2 power supplies, 5 radio frequency stages, and 2 dual-triode audio stages. Panel controls allow VFO or crystal control, phone or CW operation on both amateur bands. An auxiliary socket provides for receiver muting, remote operation of antenna relay and remote control of the transmitter such as with the Heathkit VX-1 Voice Control. Features up to 120 watts input on phone and 140 watts on CW in the 6 meter band. Ratings slightly reduced in the 2 meter band. Ideal for ham operators wishing to extend transmission into the VHF region. Shpg. Wt. 56 lbs.



HEATHKIT VHF-1 **\$159⁹⁵**



HEATHKIT DX-20 **\$35⁹⁵**

DX-20 CW TRANSMITTER KIT

Designed exclusively for CW work, the DX-20 provides the novice as well as the advanced-class CW operator with a low cost transmitter featuring high operating efficiency. Single-knob bandswitching covers 80, 40, 20, 15 and 10 meters using crystals or an external VFO. Pi network output circuit matches antenna impedances between 50 and 1,000 ohms. Employs a single 6DQ6A tube in the final amplifier stage for plate power input of 50 watts. A 6CL6 serves as the crystal oscillator. The husky power supply uses a heavy duty 5U4GB rectifier and top-quality "potted" transformer for long service life. Easy-to-read panel meter indicates final grid or plate current selected by the panel switch. Complete RF shielding to minimize TVI interference. Easy-to-build with complete instructions provided. Shpg. Wt. 19 lbs.

HEATH COMPANY Benton Harbor, Michigan



a subsidiary of Daystrom, Inc.

Mobile Gear...for the Ham on the Go!

"CHEYENNE" MOBILE HAM TRANSMITTER KIT

All the fun and excitement... plus the convenience of mobile operation are yours in the all-new Heathkit "Cheyenne" transmitter. The neat, compact, and efficient circuitry provides you with high power capability in mobile operation, with low battery drain using carrier controlled modulation. All necessary power is supplied by the model MP-1 described below. Covers 80, 40, 20, 15 and 10 meters with up to 90 watts input on phone. Features built-in VFO, modulator, 4 RF stages, with a 6146 final amplifier and pi network (coaxial) output coupling. High quality components are used for long service life and reliable operation, along with rugged chassis construction to withstand mobile vibrations and shock. Thoughtful circuit layout provides for ease of assembly with complete instructions and detailed pictorial diagrams to insure success. A spotting switch is also provided. A specially designed ceramic microphone is included to insure effective modulation with plenty of "punch". Plan now to enjoy the fun of mobile operation by building this superb transmitter. Shpg. Wt. 19 lbs.



HEATHKIT MT-1

\$99⁹⁵



"COMANCHE" MOBILE HAM RECEIVER KIT

Everything you could ask for in modern design mobile gear is provided in the "Comanche"... handsome styling, rugged construction, top quality components... and, best of all, a price you can afford. The "Comanche" is an 8-tube super-heterodyne ham band receiver operating AM, CW and SSB on the 80, 40, 20, 15 and 10 meter amateur bands. A 3 mc crystal lattice-type IF filter permits the receiver to use single conversion without image interference, and at the same time creates a steep sided 3 kc flat top IF bandpass characteristic comparable to mechanical type filters. The neat, compact and easy-to-assemble circuitry features outstanding sensitivity, stability and selectivity on all bands. Circuit includes an RF stage, converter, 2 IF stages, 2 detectors, noise limiter, 2 audio stages and a voltage regulator. Sensitivity is better than 1 microvolt on all bands and signal-to-noise ratio is better than 10 db down at 1 microvolt input. One of the finest investments you can make in mobile gear. Shpg. Wt. 19 lbs.



HEATHKIT MR-1

\$119⁹⁵

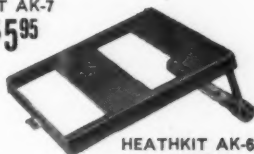
MOBILE SPEAKER KIT

A matching companion speaker for the "Comanche" mobile receiver. Housed in a rugged steel case with brackets provided for easy installation on fire wall or under dashboard, etc. Uses 5 PM speaker with 8 ohm voice coil. Measures 5" H. x 5" W. x 2 1/2" D. Shpg. Wt. 4 lbs.



HEATHKIT AK-7

\$5⁹⁵

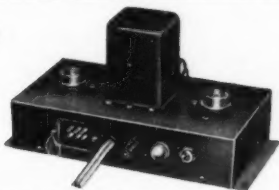


HEATHKIT AK-6

\$4⁹⁵

HEATHKIT MP-1

\$44⁹⁵



MOBILE POWER SUPPLY KIT

This heavy duty transistor power supply furnishes all the power required to operate both the MT-1 Transmitter and MR-1 Receiver. It features two 2N442 transistors in a 400 cycle switching circuit, supplying a full 120 watts of DC power. Under intermittent operation it will deliver up to 150 watts. Kit contains everything required for complete installation, including 12' of heavy battery cable, tap-in studs for battery posts, power plug and 15' of connecting cable. Chassis size is 9 1/16" L. x 4 3/4" W. x 2" H. Operates from 12-14 volt battery source. Circuit convenience provided by self-contained relay which allows push-to-talk mobile operation. Shpg. Wt. 8 lbs.

MOBILE BASE MOUNT KIT

The AK-6 Base Mount is designed to hold both transmitter and receiver conveniently at driver's side. Universal mounting bracket has adjustable legs to fit most automobiles. Shpg. Wt. 5 lbs.

POWER METER KIT

This handy unit picks up energy from your mobile antenna and indicates when your transmitter is tuned for maximum output. A variable sensitivity control is provided. Features a strong magnet on a swivel-mount for holding it on a car dashboard or other suitable spot. Has its own antenna or may be connected to existing antenna. Sensitive 200 ua meter. Shpg. Wt. 2 lbs.

HEATHKIT PM-2

\$12⁹⁵





COMPANION UNITS



HEATHKIT TX-1 **\$234⁹⁵**

"APACHE" HAM TRANSMITTER KIT

The many features and modern styling of the "Apache" will provide you with just about everything you could ask for in transmitting facilities. Emphasizing high quality the "Apache" operates with a 150 watt phone input and 180 watt CW input. In addition to CW and phone operation, built-in switch selected circuitry provides for single-sideband transmission using the SB-10 External adapter. The newly designed, compact and stable VFO provides low drift frequency control necessary for SSB transmission. A slide rule type illuminated rotating VFO dial with full gear drive vernier tuning provides ample bandspread and precise frequency settings. The bandswitch allows quick selection of the amateur bands on 80, 40, 20, 15 and 10 meters. This unit also has adjustable low-level speech clipping and a low distortion modulator stage employing two of the new 6CA7/EL34 tubes in push-pull class AB operation. Time sequence keying is provided for "chirpless" break-in CW operation. The final amplifier is completely shielded for TVI protection and neutralized for greater stability. A cooling fan is also provided. The formed one-piece cabinet with convenient access hatch provides accessibility to tubes and crystal sockets. Die-cast aluminum knobs and control panel escutcheons add to the attractive styling of the transmitter. Pi network output coupling matches antenna impedances between 50 and 72 ohms. A "spotting" push button enables the operator to "zero beat" an incoming frequency without putting the transmitter on the air. Equip your ham shack now for top transmitting enjoyment with this outstanding unit. Shpg. Wt. 110 lbs. Shipped motor freight unless otherwise specified.

HEATHKIT SB-10

\$89⁹⁵

SINGLE SIDEBAND ADAPTER KIT

Designed as a compatible plug-in adapter unit for the TX-1 "Apache" transmitter, this unit lets you operate on SSB at a minimum of cost, yet does not affect the normal AM and CW functions of the transmitter. By making a few simple circuit modifications, the DX-100 and DX-100-B transmitters can be used, utilizing all existing RF circuitry. Extremely easy to operate and tune, the adapter employs the phasing method for generating a single-sideband signal, thus allowing operation entirely on fundamental frequencies. The critical audio phase shift network is supplied completely preassembled and wired in a sealed plug-in unit. Produces either a USB, LSB or DSB signal, with or without carrier insertion. Covers 80, 40, 20, 15 and 10 meter bands. An easy-to-read panel meter indicates power output to aid in tuning. A built-in electronic voice control with anti-trip circuit is also provided. 10 watts PEP output. Unwanted sideband suppression is in excess of 30 db and carrier suppression is in excess of 40 db. An EL84/6BQ5 tube is used for linear RF output. Shpg. Wt. 12 lbs.

MODIFICATION KIT: Modifies DX-100 and DX-100-B for use with the SB-10 Adapter. Model MK-1. Shpg. Wt. 1 lb. **\$8.95.**



HEATHKIT AR-3

\$29⁹⁵

(less cabinet)

ALL-BAND RECEIVER KIT

A fine receiver for the beginning ham or short wave listener, designed for high circuit efficiency and easy construction. Covers 550 kc to 30 mc in four bands clearly marked on a slide-rule dial. Transformer operated power supply. Features include: bandswitch, bandspread tuning, phone-standby-CW switch, phone jack, antenna trimmer, noise eliminator, RF gain control and AF control. Shpg. Wt. 12 lbs.

CABINET: Opt. extra. No. 91-15A. Shpg. Wt. 5 lbs. **\$4.95.**



HEATHKIT QF-1

\$9⁹⁵

"Q" MULTIPLIER KIT

Useful on crowded phone and CW bands, this kit adds selectivity and signal rejection to your receiver. Use it with any AM receiver having an IF frequency between 450 and 460 kc that is not AC-DC type. Provides an effective "Q" of approximately 4,000 for extremely sharp "peak" or "null". The QF-1 is powered from the receiver with which it is used. Shpg. Wt. 3 lbs.

OF DISTINCTIVE QUALITY

ACCESSORY SPEAKER KIT

Handsomely designed and color styled to match the "Mohawk" receiver this heavy duty 8" speaker with 4.7 ounce magnet provides excellent tone quality. Housed in attractive $\frac{3}{8}$ " plywood cabinet with perforated metal grille. Speaker impedance is 8 ohms. Shpg. Wt. 7 lbs.



HEATHKIT AK-5

\$995



HEATHKIT RX-1

\$27495

"MOHAWK" HAM RECEIVER KIT

Styled to match the "Apache" transmitter the "Mohawk" ham band receiver provides all the functions required for clear, rock-steady reception. Designed especially for ham band operation this 15-tube receiver features double conversion with IF's at 1682 kc and 50 kc and covers all the amateur frequencies from 160 through 10 meters on 7 bands with an extra band calibrated to cover 6 and 2 meters using a converter. Specially designed for single sideband reception with crystal controlled oscillators for upper and lower sideband selection. A completely preassembled wired and aligned front end coil bandswitch assembly assures ease of construction and top performance of the finished unit. Other features include 5 selectivity positions from 5 kc to 500 CPS, bridge T-notch filter for excellent heterodyne rejection, and a built-in 100 kc crystal calibrator. The set provides a 10 db signal-to-noise ratio at less than 1 microvolt input. Each ham band is separately calibrated on a rotating slide rule dial to provide clear frequency settings with more than ample bandspread. Front panel features S-meter, separate RF, IF and AF gain controls, T-notch tuning, T-notch depth, ANL, AVC, BFO, Bandswitch tuning, antenna trimmer, calibrate set, calibrate on, CW-SSB-AM, receive-standby, upper-lower sideband, selectivity, phone jack and illuminated gear driven vernier slide rule tuning dial. Attractively styled with die-cast aluminum control knobs and escutcheons. No external alignment equipment is required for precise calibration of the "Mohawk". All adjustments are easily accomplished using the unique method described in the manual. An outstanding buy in a communications receiver. Shpg. Wt. 66 lbs. Shipped motor freight unless otherwise specified.



HEATHKIT AM-2

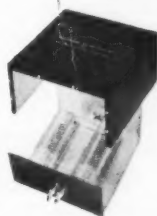
\$1595

REFLECTED POWER METER KIT

The AM-2 measures forward and reflected power or standing wave ratio. Handles a peak power of well over 1 kilowatt of energy and covers 160 through 6 meters. Input and output impedance provided for 50 or 75 ohm lines. No external power required for operation. Use it also to match impedances between exciters or RF sources and grounded grid amplifiers. Shpg. Wt. 3 lbs.

BALUN COIL KIT

Match unbalanced coaxial lines, found on most modern transmitters, to balanced lines of either 75 or 300 ohms impedance with this handy transmitter accessory. Capable of handling power input up to 200 watts, the B-1 may be used with transmitters and receivers covering 80 through 10 meters. No adjustment required. Shpg. Wt. 4 lbs.



HEATHKIT B-1

\$895



HEATHKIT VX-1

\$2395

ELECTRONIC VOICE CONTROL KIT

Eliminate hand switching with this convenient kit. Switch from receiver to transmitter by merely talking into your microphone. Sensitivity controls allow adjustment to all conditions. Power supply is built in and terminal strip on the rear of the chassis accommodates receiver and speaker connections and also a 117 volt antenna relay. Shpg. Wt. 5 lbs.



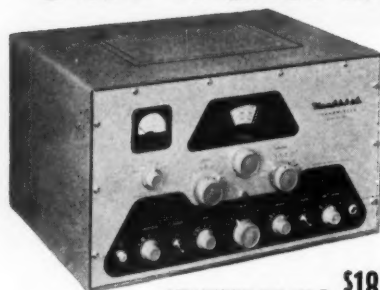
HEATHKIT VF-1

\$1950

VFO KIT

Far below the cost of crystals to obtain the same frequency coverage this variable frequency oscillator covers 160, 80, 40, 20, 15 and 10 meters with three basic oscillator frequencies. Providing better than 10 volt average RF output on fundamentals, the VF-1 is capable of driving the most modern transmitters. Requires only 250 volts DC at 15 to 20 ma, and 6.3 VAC at 0.45 a. Illuminated dial reads direct. Shpg. Wt. 7 lbs.

Save 1/2 or more...with Heathkits



HEATHKIT DX-100-B \$189⁵⁰

DX-100-B PHONE AND CW TRANSMITTER KIT

A long standing favorite in the Heathkit line, the DX-100-B combines modern styling and circuit ingenuity to bring you an exceptionally fine transmitter at an economical price. Panel controls allow VFO or crystal control, phone or CW operation on all amateur bands up to 30 mc. The rugged one-piece formed cabinet features a convenient top-access hatch for changing crystals and making other adjustments. The chassis is punched to accept sideband adapter modifications. Featured are a built-in VFO, modulator, and power supply, complete shielding to minimize TVI, and a pi network output coupling to match impedances from 50 to 72 ohms. RF output is in excess of 100 watts on phone and 120 watts on CW. Band coverage is from 160 through 10 meters. For operating convenience single-knob bandswitching and illuminated VFO dial on meter face are provided. A pair of 6146 tubes in parallel are employed in the output stage modulated by a pair of 1625's. Shpg. Wt. 107 lbs. Shipped motor freight unless otherwise specified.

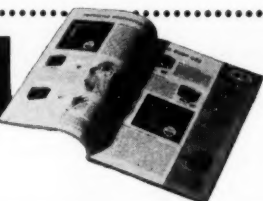


HEATHKIT DX-40 \$64⁹⁵

DX-40 PHONE AND CW TRANSMITTER KIT

An outstanding buy in its power class the DX-40 provides both phone and CW operation on 80, 40, 20, 15 and 10 meters. A single 6146 tube is used in the final amplifier stage to provide full 75 watt plate power input on CW or controlled carrier modulation peaks up to 60 watts for phone operation. Modulator and power supplies are built in and single-knob bandswitching is combined with the pi network output circuit for complete operating convenience. Features a D'Arsonval movement panel meter. A line filter and liberal shielding provides for high stability and minimum TVI. Provision is made for three crystals easily accessible through a "trap door" in the back of the cabinet. A 4-position switch selects any of the three crystals or jack for external VFO. Power for the VFO is available on the rear apron of the chassis. Easy-to-follow step-by-step instructions let assembly proceed smoothly from start to finish even for an individual who has never built electronic equipment before. Shpg. Wt. 25 lbs.

Free Send now for latest Heathkit Catalog describing in detail over 100 easy-to-assemble kits for the Hi-Fi fan, radio ham, boat owner and technician.



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do-it-yourself
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All prices and specifications subject to change without notice. Please include postage on orders to be shipped parcel post. 20% deposit is required on all C.O.D. orders. All prices are NET F.O.B. Benton Harbor, Mich., and apply to Continental U.S. and Possessions only.

NAME _____

ADDRESS _____

CITY _____

ZONE _____

STATE _____

QUANTITY	KIT NAME	MODEL NO.	PRICE

1959 EDITION

The RADIO AMATEUR'S HANDBOOK

*A*N INVALUABLE reference work and text for everyone—hams, engineers, lab men, technicians, experimenters, students, purchasing agents.

Distributors throughout the Nation have the 1959 Edition in stock. Better get your copy of this complete Handbook now. The demand is terrific!

In the pages of this latest edition will be found, in addition to accumulated knowledge since the first Handbook was issued in 1926, the latest proved findings and experiments invaluable to ham and engineer alike. Every field of ham radio is covered: transmitting, both c.w. and 'phone; receiving; propagation; antennas; construction; theory; charts; diagrams; circuits; transistors; miscellaneous data; procedures; station operation, etc.

For instance, the 1959 Edition carries

- Sections on Theory; Electrical Laws and Circuits, Vacuum Tube Principles, Semiconductor Devices, High Frequency Communication, Antennas, Transmission Lines, Modulation V.H.F. and U.H.F.
- Sections which include How-to-make-it articles dealing with Receivers, Transmitters, Power Supplies, Radiotelephony, V.H.F., U.H.F., Antennas, Mobile Equipment, radioteletype, transistorized equipment, etc.
- A separate section on test and measuring equipment
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- Many pages of valuable catalog/advertising sheets, containing manufacturers' and distributors' products and services . . . a useful supplement to the editorial section
- Plus thorough treatment of such subjects as assembling and operating a station, BCI and TVI, construction practices, etc. — and fully indexed and completely illustrated throughout. You can locate in a jiffy what you want.

▶ **\$3.50** U.S.A. Proper **\$4.00** U.S. Possessions and Canada. Elsewhere, **\$4.50**. Buckram bound Edition, **\$6.00** everywhere. All prices postpaid.

The AMERICAN RADIO
RELAY LEAGUE, INC.

West Hartford 7, Conn. • U.S.A.

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a \$16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-T12TG)

List of 105 countries/stations worked with 65 watts and a V-80 vertical

BY1US	KG4AI	VK3YL
CE3DZ	KG6FAE	VK9XK
ZL5AA	KH6J	VK9AT
CO2W0D	KL7BUZ	VK9CJ
CN2BK	KM6AX	VP2KFA
CN8FB	KP4ACF	VP2AY
CR9AH	KP6AL	VP2DW
CT1CB	KR6BP	VP2MX
CX2FD	KS4AZ	VP2LU
DL1FF	KV4AA	VP2SW
DU7SV	KW6CA	VP5CP
EA1FD	KX6AF	VP5BH
EA1N	KZ5CS	VP6TR
FBVQ	LA3SG	VP7NM
FBZJZ	LU2DFC	LU1ZS
FG7XE	LZ1KSP	VP9BK
FK8AL	O44AU	VR2DA
FM7WT	OE9EJ	VR3B
FOBAD	OH2TM	VS1HC
G3DGO	OK1FF	VS2DW
GC8DO	ON4AY	VS6LN
G13WUI	OG1AX	XE1PJ
GM3GJB	OZ2KK	XW8AI
GW3LJN	PA1FAB	YN1JW
HA5KBP	PJ5AA	YU3FS
HC4IM	PJ2ME	YV5HL
HC8LUX	PY2EW	ZC5AL
HE9LAC	PY8NE	ZE1JV
HP1LO	SM5AQ8	ZK1BS
II1MV	SP6BY	KH6MG/ZK1
JAT1ANG	T12LA	ZK2AD
JZ0HA	UA1AU	ZL1ABZ
W1AW	UA1KKB	ZL3JA
K68BJ	UQ2AB	ZM6AS
KC4AF	VE8OJ	ZS1OU

SOME QUESTIONS AND ANSWERS

Why are all Gotham beams of the Yagi type, all metal, and grounded at the center? Answer: To get the maximum strength for the minimum weight, to get maximum efficiency, and to avoid the use of wood, tuning stubs, traps, or other substitute devices, all of which are undesirable and unnecessary. In addition, grounded beams are lightning-proof and protect your home.

How do Gotham beams gain compare with higher priced antennas? Answer: No beam, regardless of price, can give more gain, for a given boom size, than a Gotham beam. Obviously, the more elements, the more gain. Our gain figures are published in our literature, and are available, free, on request.

Why is the Gotham price so very low? Doesn't the low price mean a lack of quality? Answer: The Gotham price is low because we sell in quantities and make only a fair profit on each antenna. We do not add on a tremendous overhead and engineering charge. As for quality, we have always used the best materials, and every antenna is doubly inspected before shipment. Thousands of Gotham antennas are in use the world over.

What is the difference between the Standard and the Deluxe beams? Answer: The Standard beams in the 6, 10, and 15 meter bands use $\frac{3}{8}$ " and $\frac{1}{2}$ " tubing elements; the Deluxe models for these bands use $\frac{1}{2}$ " and 1" tubing. In the 20 meter beams, the Standard beams have a single boom, while the Deluxe beams use twin booms. All 20 meter beams use full 12 foot booms. In the 20 meter beams and in the Twobanders and Tribanders, only $\frac{3}{8}$ " and 1" tubing are used.

Is it advantageous to use a Gotham Twobander or Tribander beam? Answer: Hundreds of these beams are in daily use. They are compromise beams, but by having each element a full half-wave, their gain figures are more than reasonably good. Of course a single three element beam on a single band will outperform a Tribander on that band, but the Tribander permits beam operation on three bands.

Do the Gotham verticals perform well on all bands? Answer: Yes, thousands of ham users attest to their efficiency on all bands from 6 to 160 meters. Reports of tremendous DX on low power are common.

Are mounts supplied with the vertical antenna? Answer: Yes, four mounting straps for side mounting are furnished with each vertical.

Are radials needed with a Gotham vertical? Answer: No, except a few rare locations. 99% of the installations are done without radials.

How much power can be used with a Gotham vertical? Answer: Anything up to the legal limit.

Is much space required for installing a vertical? Answer: No, only a few square inches are needed.

Can you give details on the loading coil used in the Gotham verticals? Answer: Yes, it is made for us by Barker and Williamson. It is 3" in diameter and exceptionally rugged. No other loading coil in the antenna industry has a higher Q.

Do you need a separate loading coil for each band? Answer: No, a V160 loading coil will cover 160, 80, 40, 20, 15, 10, and 6; a V80 loading coil will cover 80, 40, 20, 15, 10, and 6; a V40 loading coil will cover 40, 20, 15, 10, and 6 meters.

What antennas are best for a novice? Answer: The V80 vertical and the S153N beam are the most popular choices.

Why should a ham buy a Gotham antenna? Answer: The tremendous progress of the amateur radio art makes it imperative that hams graduate from the antiquated antennas of years past to a modern antenna system. We will be glad to send, free of charge, our technical literature on our 50 antennas, or you can order for immediate shipment.

73,
GOTHAM

FREE literature ? YES
FREE specifications ? YES
FREE beam gain calculator ? YES
OR ALL THREE AND IMMEDIATE SHIPMENT
IF YOU ORDER FROM THIS LIST OF 50 ANTENNAS

Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. QST

1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for

TWO BANDER BEAMS

A full half-wave element is used on each band. No coils, traps, baluns, or stubs are used. No calculations or machining required. Everything comes ready for easy assembly and use. *Proven Gotham Value!*

6-10 TWO BANDER.....	<input type="checkbox"/>	\$29.95
10-15 TWO BANDER.....	<input type="checkbox"/>	34.95
10-20 TWO BANDER.....	<input type="checkbox"/>	36.95
15-20 TWO BANDER.....	<input type="checkbox"/>	38.95

TRIBANDER

Do not confuse these full-size Tribander beams with so-called midjets. The Tribander has individually fed (52 or 72 ohm coax) elements and is not frequency sensitive, nor does it have baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander Beam.

<input type="checkbox"/> 6-10-15	\$39.95	<input type="checkbox"/> 10-15-20	\$49.95
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2 METER BEAMS

Gotham makes only two different two meter beams, a six-element job and a twelve-element job. They are both Yagi beams, with all the elements in line on a twelve foot boom.

<input type="checkbox"/> Deluxe 6-Element	9.95	<input type="checkbox"/> 12-El	16.95
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6 METER BEAMS

New records are being made every day with Gotham six-meter beams. Give your rig a chance to show what it can do, with a Gotham six-meter beam.

<input type="checkbox"/> Std. 3-El Gamma match	12.95	<input type="checkbox"/> T match	14.95
<input type="checkbox"/> Deluxe 3-El Gamma match	21.95	<input type="checkbox"/> T match	24.95
<input type="checkbox"/> Std. 4-El Gamma match	16.95	<input type="checkbox"/> T match	19.95
<input type="checkbox"/> Deluxe 4-El Gamma match	25.95	<input type="checkbox"/> T match	28.95

10 METER BEAMS

Ten meter addicts claim that ten meters can't be beaten for all-around performance. Plenty of DX and skip contacts when the band is open, and 30-50 miles consistent ground wave when the band is shut down. Thousands of Gotham ten meter beams have been perking for years, working wonders for their owners, and attesting to the superior design and value of a Gotham beam.

<input type="checkbox"/> Std. 2-El Gamma match	11.95	<input type="checkbox"/> T match	14.95
<input type="checkbox"/> Deluxe 2-El Gamma match	18.95	<input type="checkbox"/> T match	21.95
<input type="checkbox"/> Std. 3-El Gamma match	16.95	<input type="checkbox"/> T match	18.95
<input type="checkbox"/> Deluxe 3-El Gamma match	22.95	<input type="checkbox"/> T match	25.95
<input type="checkbox"/> Std. 4-El Gamma match	21.95	<input type="checkbox"/> T match	24.95
<input type="checkbox"/> Deluxe 4-El Gamma match	27.95	<input type="checkbox"/> T match	30.95

New! Ruggedized Hi-Gain 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

<input type="checkbox"/> Beam #R6 (6 Meters, 4-El)...	\$38.95
<input type="checkbox"/> Beam #R10 (10 Meters, 4-El)...	40.95
<input type="checkbox"/> Beam #R15 (15 Meters, 3-El)...	49.95



15 METER BEAMS

Fifteen meters is the "sleeper" band. Don't be surprised if you put out a quick, quiet CQ and get a contact half-way around the world. Working the world with low power is a common occurrence on fifteen meters when you have a Gotham beam.

15 METER BEAMS

<input type="checkbox"/> Std. 2-El Gamma match	19.95	<input type="checkbox"/> T match	22.95
<input type="checkbox"/> Deluxe 2-El Gamma match	29.95	<input type="checkbox"/> T match	32.95
<input type="checkbox"/> Std. 3-El Gamma match	26.95	<input type="checkbox"/> T match	29.95
<input type="checkbox"/> Deluxe 3-El Gamma match	36.95	<input type="checkbox"/> T match	39.95

20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRM and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

<input type="checkbox"/> Std. 2-El Gamma match	21.95	<input type="checkbox"/> T match	24.95
<input type="checkbox"/> Deluxe 2-El Gamma match	31.95	<input type="checkbox"/> T match	34.95
<input type="checkbox"/> Std. 3-El Gamma match	34.95	<input type="checkbox"/> T match	37.95
<input type="checkbox"/> Deluxe 3-El Gamma match	46.95	<input type="checkbox"/> T match	49.95

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

ALL-BAND VERTICAL ANTENNAS

You could work the whole world, and get fantastic reports, with a Gotham vertical and only 55 watts, like VPISD.

You could work tremendous skip and DX, and be surprised at the way your Gotham vertical brings them in, as R. E. C. of Washington, D. C., found out.

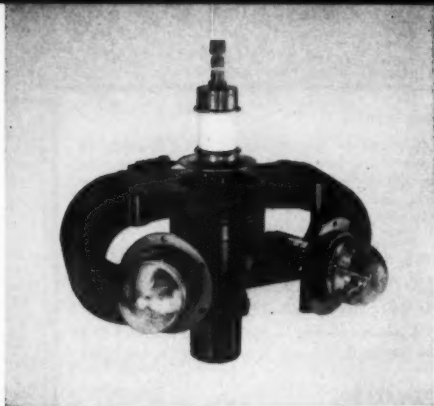
You could have a simple, easy-to-install-and-operate vertical antenna, and switch from band to band, as thousands of Gotham customers have done.

<input type="checkbox"/> V40 vertical for 40, 20, 15, 10, 6 meters.	\$14.95
<input type="checkbox"/> V80 vertical for 80, 75, 40, 20, 15, 10, 6 meters.....	\$16.95
<input type="checkbox"/> V160 vertical for 160, 80, 75, 40, 20, 15, 10, 6 meters.....	\$18.95

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

FREE! WITH EACH ANTENNA OR REQUEST FOR FREE BROCHURE, THE NEW GOTHAM BEAM CALCULATOR.

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100 MEGAWATTS is potentially available from Amplitron® microwave amplifier—a Raytheon invention. Uses: multi-megawatt radar; space transmission.

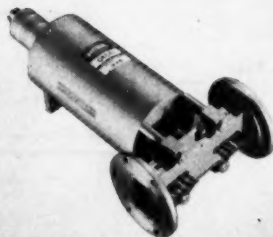
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TYPES PRODUCED BY RAYTHEON**



M-TYPE BACKWARD WAVE OSCILLATOR, just declassified, covers 8,150-11,000 mc. Can be AM/FM modulated at over 10 mc per second. Uses: counter-measures; FM/CW radar.



FIRST ONE-WATT KLYSTRON to cover entire government band, QK-661 is a mechanically tuned, reflex-type tube with integral cooling fins, wave-guide output.



20 DB. GAIN is achieved by QK-542, a 5-watt, low-noise traveling wave tube. Under development: electrostatic focusing; high-power TWTs.

*Raytheon Trademark

Engineers—BS or advanced degree

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8 OZ., 400-WATT MAGNETRON, 2-in. long, 1½-in. diameter, typifies tiny, lightweight magnetrons developed by Raytheon for missiles and beacons.

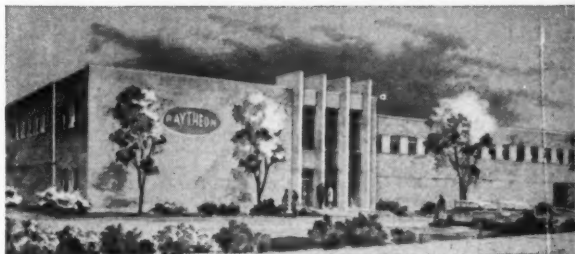


NEW, 1000-LINE DUAL GUN storage tube simultaneously stores and displays signals in 1/60-second, has unique tetrode electron gun for higher resolution and linear transfer characteristics.

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From the "World's Largest"

Trap

for 10, 15 and 20 meters

- ★ Automatic 10, 15 and 20 meter operation with ENTIRE WHIP OPERATIVE on all three bands for MAXIMUM EFFICIENCY.
- ★ Unique three band frequency selective circuits select proper amount of inductance for high efficiency CENTER LOADED whip operation on 15 and 20 meters. Loading coil is automatically shorted out for full sized quarter wave whip operation on 10 meters.
- ★ Coil is high Q air wound of No. 14 copper wire on ribbed high impact styron form. Entire assembly is enclosed in completely weatherproof, air tight plastic cover. Air foil design, only $1\frac{1}{2}$ " wide and $4\frac{1}{2}$ " high.
- ★ May be used with any standard 3' base section and 5' whip, or Hy-Gain's new telescoping base and whip assembly. Telescopes down to only 3' for easy garaging. No base spring necessary. Especially designed high pressure knurled knobs maintain perfect mechanical and electrical contact in telescoping sections when whip is fully extended.
- ★ Designed for 52 ohm Coax, SWR less than 2:1 on all bands.

Trap traveller mobile automatic three band loading coil Model No. T-3. May be used with any standard three foot base and 5' whip or with Hy-Gain telescoping base section and top whip assembly. Air foil design only $1\frac{1}{2}$ " wide by $4\frac{1}{2}$ " high.

Ham Net **\$14⁹⁵**

Especially designed Hy-Gain telescoping base section and top whip assembly Model TBW. Base section, $\frac{5}{8}$ " OD and $\frac{1}{2}$ " OD chrome plated high tensile strength steel. Base stud $\frac{3}{8}$ " x 24 threads. Fits all standard mobile mounts. 5' top whip 250,000 FSI stainless steel. Electrical and mechanical connections at all telescoping joints maintained by positive grip knurled knobs. When used with trap traveler three band mobile coil, total extended height will be $8'4\frac{1}{2}"$. Telescopes down to approximately 3' for easy garaging.

Ham Net **\$15⁰⁰**

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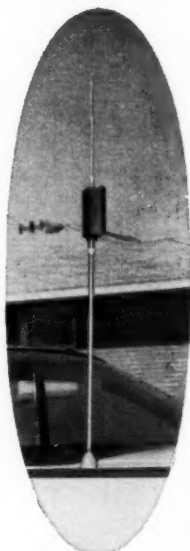


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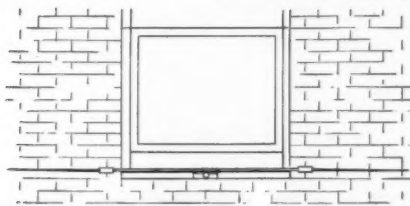
LINCOLN, NEBRASKA



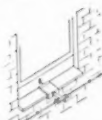
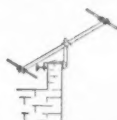
Manufacturer of Amateur Communications Antennas

Traveller

Trap Traveller PORTABLE Micro-Dipole



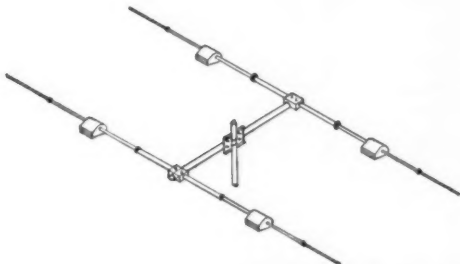
The Hy-Gain Trap Traveller dipole kit utilizes two trap traveller three-band loading coils and makes into a midget high efficiency dipole for 10, 15 and 20 meters. It mounts anywhere, matches 52 ohm coax line with low SWR across all three bands. The trap traveller dipole is all aluminum construction. Approximately 16' overall when extended, the sections collapse down to only three feet for easy carrying and transportation. Complete with all hardware and dipole mounting bracket which fits most sizes of masts. Requires two trap traveller three band loading coils. Model TDK. Ham Net \$9.95.



The Hy-Gain Universal Mounting Bracket assembly consists of a uniquely adjustable screw driven clamp mechanism together with a 2' mast. It mounts easily and quickly to window sill frames, building fire walls, vent pipes, chimneys, trees, posts, roof overhangs and many others. Both the trap traveller dipole and trap traveller micro midget beam mount quickly and easily on the universal mounting bracket assembly. Mast is adjustable through a 90 degree arc from vertical to a horizontal position. Model UB. Ham Net \$9.75.

First COMPLETELY PORTABLE Tribander

MICRO-BEAM



The Hy-Gain Trap Traveller Beam Kit uses four trap traveller three band loading coils and makes up into the world's first truly miniature, completely portable two-element three-band beam. All elements and boom are aluminum. Elements when fully extended are approximately 16' overall; boom length is 6'. The entire Micro-Midget beam collapses into a three foot long package for easy transportation and carrying. It requires 4 trap traveller three band loading coils. Model TBK. Ham Net \$19.95.

Plastic Carrying Bag . . .



A convenient and attractive plastic carry bag with full length zipper. Holds either trap traveller dipole or micro midget trap traveller two element beam. Plenty of space for all necessary trap traveller loading coils and/or universal mounting bracket. Model TCC. Ham Net \$8.95.





NEW GONSET SSB Xmtr and SSB LINEAR AMPLIFIER...



GSB-100 SSB TRANSMITTER



GSB-100 SSB TRANSMITTER[®]

The GSB-100 operates on SSB with selectable sidebands. When used on AM, it transmits both sidebands, which makes 100% modulation possible without the distortion that accompanies highly modulated carrier-and-one-sideband signals when received on a conventional AM receiver.

Exclusive Filter-Phasing • Uses Gonset's exclusive filter-phasing system that greatly improves SSB quality. Unwanted sideband suppression 45 db.

Carrier Elimination • Quartz crystal filter suppresses carrier by more than 60 db, eliminates need for adjusting carrier balance and sideband suppression.

Selectable Sidebands • AM, PM, or CW, with excellent keying characteristics.

Frequency Control • By fixed quartz crystals and exceptionally stable VFO. Complete band coverage with 5-kc calibration on 10½" drum for each band. Only band in use shows. Precision 100:1 gear-ratio dial drive.

VOX • Voice-operated control system. Complete with anti-trip circuit. Biasing voltage available for linear amplifier cut-off when receiving.

Coverage • Flexible pi network output, quick band change in 80, 40, 20, 15 and 10 meters. All operation controls on front panel.

Power Supply • Built-in heavy-duty AC.

GSB-100 SSB Transmitter, Model 3233...479.50

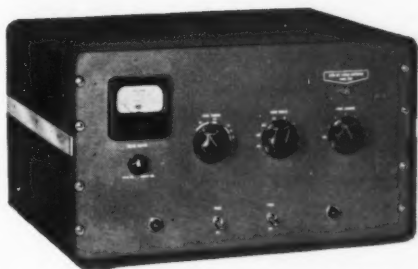
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GONSET



POWER-PER-DOLLAR OUT DX THEM ALL!

Some people are still driving jalopies, others are roaring down the road in powerful new sportscars. If you're still plodding through the airways with out-dated equipment, there's no better way to roar down the bright new road of single sideband than with the power-packed Gonset GSB-100 SSB Transmitter and the Gonset GSB-101 SSB Linear Amplifier! The 100-watt P.E.P. power input makes the GSB-100 a complete transmitter. When used as an exciter with the GSB-101, it gives you far-reaching power at an unmatched price! Alike in styling, both units have exclusive features that give you the best power-for-dollar your money can buy!



GSB-101 LINEAR AMPLIFIER

GSB-101 LINEAR AMPLIFIER

If you've been reading a lot of claims about **input** these days, consider what you're really getting in down-to-earth watt-per-dollar **output**. Gonset's **GSB-101 Linear Amplifier** gives you up to **65% efficiency!**

Built-in DC-Operated Antenna Relay • Means quiet operation. Four 811A tubes and two 866A rectifiers.

Power Input • 1000 watts P.E.P. Grounded grid principle does not waste drive power by swamping exciter. Driving power appears in output of final.

Driving Power Required • The Gonset GSB-100 easily supplies the required 60 to 70 watts. Similar 100-watt-class transmitter may be used.

Coverage • 80, 40, 20, 15 and 10 meters.

Other Features • Full bandswitching; easily loaded, flexible pi network output—matches 30-200 ohms; built-in power and bias supplies.

GSB-101 Linear Amplifier, Model 3262 \$439.50



COIL-LESS GONSET 3-BANDER CAN BE TUNED WITH A TAPE MEASURE!

The new Gonset 3-element full-length beams, with improved mechanical design, give you high-gain and superior performance in 10-, 15-, and 20-meter bands—without coils of any kind to blow out! Unique, multiple-sleeve concentric elements are pre-cut to correct electrical length. Tuning sleeves resonate concentric cavities to isolate element sections which act together for 20M, and electrically disconnect successive sections for 15M and 10M.

SPECIFICATIONS:

Frequency Coverage • 14-14.35 mc; 21-21.45 mc; 28-29.7 mc.

Typical Forward Gain • 10M, 8.4 db; 15M, 8.1 db; 20M, 8.2 db.

Front-to-Back Ratio • 24-28 db.

Typical VSWR • Not more than 1.4 to 1 across the phone or CW band segments at heights greater than 35 feet.

Feed • Beam is fed with single RG8/U cable.

Weight • 65 pounds.

Capacity • Beam will handle 1 KW AM, 100% Modulated.

3-Element Beam, #3220 ... 124.50

2-Element Beam, #3219 also available at 84.50

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HQ-160 RECEIVER	379.00
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CLOCK TIMER	10.00

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Station Activities

(Continued from page 106)

2nd 5 ke. at 1800, NYS C.D. on 3509.5 and 3093 ke. at 0900
S. ... TCPN 2nd call area on 3970 ke. at 1900, LSN on
3970 ke. at 1600. We are pleased to announce the appoint-
ment of the following ECs: W2EZF, Clinton Co.;
K2GSO, Livingston Co.; K2MTU, Cortland Co.; and
W2YIY, Steuben Co. K2MES was appointed OPS and
K2SSX ORS. Endorsements as ORS include W2BLO,
K2KIR, K2MKT, K2SIL and K2UJZ. K2UJZ received
WAC on 28-Mc. c.w. using 30 watts. W2IEP reports that
a new equipment display with prizes was very successful
at a recent meeting of the Greene ARC attended by 177
area hams, Wyoming Co. C.D. meet on 29.093 Mc. at
2000 Thurs. reports K2DOZ. W2EMW received a 220
sticker for DXCC. The Syracuse V.H.F. Club is building
15 mobile 6-meter units as a club project. K2EQB re-
ceived a club award from the Niagara RC. K2CUQ has
a sticker for YLCC/200. The Kenmore High School RC
made recent tours of local TV and FM stations and now
has a 2-meter rig and a 500-watt all-band rig on the air.
K2MXA is going on 220 Mc. K2JZM reports that
K2MTZ demonstrated a 10,000-Mc. rig to the high school
radio club. K2BU has home-brewed s.s.b. on 20 meters.
K2JSE regularly transmits Official Bulletins on 30.23 Mc.
at 2300 on Tue., Thurs. and Sun. in the Buffalo Area.
The 6-Meter Mobile Association of W.N.Y. (Buffalo) elected
K2QJJ, pres.; K2LXD, secy.; and K2EAK, treas.
K2TDN passed the General Class exam. The Elmira
Club (W2ZJ) is conducting classes for Novices, reports
K2UOV. K2INI got DXCC. K2YPG and K2UJU have
built 6-meter converters. Don't forget the RARA Ham-
fest to be held May 16 at Doud Post, Rochester.
K2JMY received his DXCC. Congratulations to
K2GWN, K2QHR, W2RUF and K2SSX on making BPL
Traffic: (Feb.) K2QHR 1002, K2GWN 999, K2MES 839,
K2SIL 735, W2RUF 370, K2SSX 280, W2EZB 179,
K2KQC 138, W2TPV 123, K2AOQ 111, K2RTN 100,
W2RUT 98, W2OE 89, K2UJZ 89, K2RYH 85, W2ABL
84, W2PTA 80, K2RWV 68, K2JBX 65, W2FEB 58,
K2QDT 53, K2GOU 37, W2COB 31, W2OHU 24, W2RJJ
24, RQF 24, K2TQC 23, K2YVP 20, W2CXM 18, K2OFV
15, W2ZDI 12, K2DOZ 10, W2BLO 6, K2MKT 6,
W2MTA 6, W2BKC 5, K2HUK 4, K2EQB 3, W2ZRC 2,
(Jan.) K2QHR 268, W2RUT 110, K2OFV 16, K2UJZ 15,
K2IYP 10, W2ZRC 10, W2BLO 2.

WESTERN PENNSYLVANIA—SCM, Anthony J.
Mroczka, W3UHN—SEC, OMA, RMs: GEG, NUG and
LXU. PAMs: AER and TOC. The WPA Tfc. Net meets
Mon. through Fri. at 1900 EST on 3585 ke. The Pennsylv-
ania Fone Net (PFN) meets Mon. through Fri. at 1800
EST on 3850 ke. New appointees are LXU as RM and
UEM as ORS. BMK has gone s.s.b. FBX and ZIJ are
mobile. K3COT is on 10-meter phone. KNQ is trying to
find time to operate. K3ANY is going s.s.b. Members of
the ATA visited TV station WJIC on channel 11 for their
March meeting. LXU has a new Viking Ranger/Courier.
Up Erie way: K3BTP has been keeping regular schedules
with his brother, HLM, located on an Arctic ice flow
north of Greenland; NMP now is heading the TVI com-
mittee; WDK and LSS are compiling a listing of all
county c.d. operators; YWM went and got himself mar-
ried. DTZ now has his General Class license. The Etna
RC reports via the Oscillator: Orchids to K3BZP who
gave his Globe Chief to KN3HA, a handicapped ham
in Meadville; K3BZP is active on 10- and 15-meter
phone; The Breeze Shooters Hamfest is going to be held
May 24; congratulations to K3AIS on receiving her Gen-
eral Class license at the age of 69; the Uniontown RC
(PIE) has announced that its hamfest will be held July
11. The Steel City ARC reports via Kilo-Watt Har-
monics: Steel City is going AS. has received an FB TV
picture from QVV at an airline distance of 16 miles;
MPK is constructing a TV beam for the club and ZPJ
is purchasing transmitter gear including a camera; SVJ
now is with the Army in Europe; YDP is on 6 meters;
NKM is waiting for his HT-324 and Thunderbolt ampli-
fier. The AKARA reports getting some new committees
organized for the benefit of the club; IWG is building a
new rig. W8X now is operating s.s.b. Traffic: W3KUN
236, LXU 198, NUG 30, UHN 26, K3COT 15, W3KNQ 10,
LOD 4, WRE 4, TOC 1.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst.
SCM, Grace V. Ryden, 9GME, SEC: HOA, RM: PCQ.
PAM: RYU, EC Cook County: HPG. Section net: ILN,
3513 ke. Mon. through Sat. at 1900 CST. The week end
of August 22 and 23 has definitely been selected for the
combined Central and Midwest Division Convention. The
host city will be St. Louis, Mo., and the activities will
be held at the Chase Hotel in that city. Reports still are
(Continued on page 128)

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32S-1 TRANSMITTER!



INTRODUCING COLLINS NEW S LINE

32S-1 Transmitter—3.5-29.7 mc. 175 watt PEP input on SSB; 160 watt on CW. Incorporates time-proved features of KWS-1, KWM-1 including Mechanical Filter-type sideband generation; stable, permeability-tuned VFO; crystal-controlled high frequency oscillator; RF inverse feedback for better linearity, and automatic load control for higher average talk power. 6 $\frac{1}{2}$ " H, 14 $\frac{1}{2}$ " W, 11 $\frac{1}{2}$ " D.

32S-1 Transmitter	\$ 590.00
516F-2 AC Power Supply	105.00
516E-1 12V DC Power Supply	262.00
75S-1 Receiver	495.00
312B-3 Speaker	27.50
312B-4 Speaker Console	185.00
KWM-1 Transceiver	820.00

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CONGRESS is certainly in the news these days—haggles, wrangles, debates, and good honest work, too—with its efforts to provide for the general good of the country.

OUR own "congress," the Board of Directors, will be meeting this month, too. With much less fanfare and considerably greater efficiency, they, too, will try to accomplish what needs to be done for the League and all amateurs.

YOUR Director will be there, representing the amateurs of your division. Naturally, the wishes of his constituents will be important to him in making decisions on amateur affairs.

AND say—if you've been putting off applying for membership, do it now. Stand up and be counted as a "citizen" of our democracy-within-a-democracy. Dues, including QST subscription, are \$4 in the U. S. and possessions, \$4.25 in Canada, and \$6 elsewhere.

**THE AMERICAN
RADIO RELAY LEAGUE
WEST HARTFORD 7, CONNECTICUT**

coming in with fine results of the amateur participation in the January ice and sleet storm that tied up communications and railroads. The railroads were without telegraph wires for several days and the various nets were working on around-the-clock schedules to keep the railroads rolling. K9ISP has earned his 9RN certificate. IRH and JNN are winners of the c.w. and K9EED and ZUV are winners of the Phone S.S.B. Contest, sponsored by the Hamsters (Chicago). HPG reports that he is making the rounds of the clubs in his new capacity as Vice-Director. PCQ reports that the ILN cleared 287 messages in 22 sessions and CSW and the North Central Phone Net says that his gang's traffic total was 600 for the month. KN9PCS notifies us that the new traffic net operates in the Chicago Area on 7.180 Mc. Mon., Thurs. and Sat. at 2000 CST and is known as the Evening Novice Net. K9KQP is now sidebanding with a new rig. W1BDI, of the Headquarters staff, visited the Peoria and Bloomington Clubs and made a presentation at the Starved Rock Radio Club's 25th ARRL Affiliation Dinner. K9LLD, secy.-treas. of the National Trail Amateur Radio Club at Springfield, reports that the club received its ARRL affiliation club papers. RNM and JJJ called a meeting of all interested clubs and amateurs that would cooperate with c.d. officials in the establishing of a statewide storm-reporting system. EU has completed his DX list now with 221 countries confirmed. Four hundred persons were rescued by an amphibious duck when the Rock River went over the flood stages and communications were carried on by RYU, OWN, UCZ and K9EUF. MXT, K9KXP and K9KQB were elected as new officers for the coming season of the Collinsville Amateur Radio Society. The Starved Rock Radio Club's Annual Hamfest will be held at the same place as last year on Sun., June 7. YUP has just finished construction of a new Mohawk receiver. K9DTB is working FB DX on 50 Mc. with 40 states. PSP's XYL has the call K9ONX. K9HWC has a new Globe 6-2. K9CSI is going mobile with his new MG. VWJ and the Montgomery Council Civil Defense Net is making good progress and the gang down there is having fine Friday night drills. The NCS of the ILN requests that those members who do not report their traffic to this column please send it to him and he will forward it. Traffic: W9DO 1176, IDA 716, PCQ 293, K9MHW 275, W9FAW 230, USR 198, K9ISP 170, W9MAK 132, OFR 128, K9JSV 122, W9WJ 104, SXL 93, CSW 60, EU 42, KN9LOO 30, K9IXK 28, W9SKZ 27, K9GSR 19, KN9OUU 17, K9JIN 15, W9HPG 9, SKR 6, PRN 5, K9BTE 3, ERH 1, W9GFF 1.

INDIANA—SCM, Arthur G. Evans, W9TQC—Asst. SCM: Seth Lew Baker, 9NTA. SEC: SNQ. PAMs: BDG, BKJ, KOY and UXK. RMs: DGA, TT and VAY. Net skeds: IFN (a.m.) 0800 daily and 1800 M-F on 3910 kc.; ISN (a.s.h.) 1830 daily on 3920 kc.; QIN 1900 daily and RFN 0700 Sun. on 3656 kc. SNQ has obtained two new ECs, K9GMH for Cass Co. and ZSL for Madison Co. Other station appointments were MEK as OPS, NTI as OBS and OPS and ZSA as OO Class I. The Duneland ARA will hold its annual banquet May 2 in Valparaiso. The Indiana Memorial Union RC has been formed at Bloomington with BOS, pres.; K9OFH, vice-pres.; AMR, secy.; K9APH, pub. Another new club is the Gib-Ares in Gibson Co. with URQ, pres.; FJI, vice-pres.; K9LLK, secy.-treas.; and K9HKI, IIV and ZZR, dir. New officers of the Northeast ARC are MDC, pres.; QWI, vice-pres.; and K9AIN, secy. K9JJC is editor of an outstanding new paper being put out by the Delaware ARA. The Wabash Valley gang is organizing a 6-meter net. JBQ reports four new calls as a result of the classes held by the Clark Co. ARC. K9DWK has worked 94 and FYM 140 countries. Bud, ex-9HXR is now WA6DWA. Watch for DL4GY; the operator is K9HHV. K9HMN is building a linear with a pair of 811s to run 500 watts. K9DCX is completing plans for a panel net complete with a.c. generator for the Howard Co. AREC. SYM is building a rig for 6 meters. MEU has a new 75A-4. VAY reports FJR, ZYK, JOZ and VAY made the QIN Honor Roll. QIN traffic was 608. RFN traffic, as reported by, TT was 95. BDG had a big month to start him out on his PAM job as IFN traffic for the morning net was 168 and the evening net 484. KOY reports a traffic count of 145 for ISN. K9GLL reports traffic on IMO as 37, DGA, FJR, K9IXD, JOZ and NZZ made BPL. This is BPL No. 96 for NZZ. Traffic: (Feb.) W9JOZ 1068, NZZ 872, FJR 507, ZYK 450, TT 329, VAY 323, DGA 178, K9IXD 172, W9BQ 146, HLZ 133, TQC 133, ETM 128, SVL 105, BDG 99, KOY 94, SWD 91, EGV 73, MEK 69, K9GBB 65, W9SNQ 63, IMU 60, K9KBW 56, AYI 55, W9DOK 55, EHJ 51, PMT 49, K9JKK 45, W9GJS 41, BUQ 40, CDW 39, NTI 34, RTH 34, DDT 31, K9BSU 27, W9QWI 26, K9HMC 24, W9ZSL 24, EJW 22, YXZ 21, ZPP 21, ENU 20, DZC 19, GPD 19, CC 17, K9PTS 17, W9BDP 16, K9EEK 16, W9QR 15, FYM 14, AB 10, EUP 10, K9AOM 9, DWK 8, HWN 8, W9UXK 4, K9GSV 3, W9NTR 2, VQP 2. (Jan.) W9SYM 17,

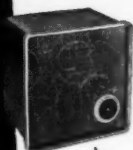
(Continued on page 128)

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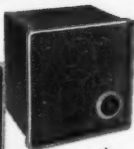
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WISCONSIN—SCM, George Wolda, W9KQB—SEC: YQH, PAM; NRP, V.H.F. PAM Northern Wis.: GFL, V.H.F. PAM Southern Wis.: K9IQO, RMs: SAA, K9AEQ, K9ELT, K9LCA is a new OPS and ORS, KN9PQT, following in his Dad's (RQM) footsteps, made 303 contacts in 61 sections in the Novice Roundup. UTW and NLJ are new DXCC members. OMZ and GIL have DXCC, phone only. Net certificates were received by DQS, DUQ and K9QBH, members of the WTN, operating on 31.1 Mc. New officers of the BARS of Madison are W3ZLA, pres.; K9EOP, vice-pres.; K9BRJ, secy.-treas.; VOO, trustee; LPL, chief engineer. The Oshkosh Club's 1815-ke. net meets Sun. at 2000 CST. RH, one of the MRAC's oldest members, is recovering from a heart attack. The Milwaukee Club lists among its members amateurs in nine states plus FL8AC, formerly of French Somoliland, now in Lagos, Nigeria. Add to the list of stamp-collecting Wisconsin amateurs, K9PDJ, CCO, chairman of the newly-organized Explorer Post at White-water, is teaching its members the art of ham radio. The new v.h.f. club at Milwaukee lists its officers as K9IQO, pres.; MMA, vice-pres.; K9LMW, secy.; ZDI, treas.; JCI, program dir. Activity reports are being received from but 4 clubs of the 32 registered with the SCM. Among the recent graduates of the U. of Wis. were LYH, VBR, HZF and K9KCS. VHP is building a new receiver to make his station completely homebrewed. Those desiring to keep up their code speed and learn traffic-handling will find the WSSN on 3617 kc. Mon. through Sat. at 1830 the answer. Traffic: (Feb.) W9DYG 586, KON 392, K9DAC 342, W9SAA 208, KQB 124, K9GYQ 101, ELT 83, W9YZG 71, K9DTK 57, IQO 47, LMX 29, IOL 27, W9IKY 25, CCO 21, YT 18, NLJ 16, VHP 16, WJH 16, CBE 15, K9MS 14, W9FXA 12, SIZ 11, K9PDJ 10, W9PJT 10, K9LMW 9, W9VTK 8, K9CEF 5, ESN 2, GDF 2, LCA 2, W9RQM 2. (Jan.) W9NQW 336, NLJ 6, SIZ 3.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, W0HVA—SEC: K0JLW, PAM: YCL, RM: K0CNC. The North Dakota C.W. Net reports 19 sessions with 46 check-ins. NCSS are JBM and K0ATK. The Jamestown Amateur Radio Club has elected AIU, pres.; EOZ, vice-pres.; and K0CNC, secy.-treas. K0CNC uses "lineman's gloves to change flashlight batteries after a regrettable incident with 1200 volts d.c." At the February meeting of the Theodore Roosevelt Amateur Radio Club the following were elected: K0AZX, pres.; NAD, vice-pres.; K0MEF, secy.-treas.; K0KBV, pub. chairman; and ZCM, ad. mgr. Further plans were made for the State Convention and Hamfest to be held in Dickinson July 11 and 12. The new officers of the Central Dakota Radio Club are HVA, pres.; K0JLW, vice-pres.; K0COV, secy.; K0ESO, treas.; and IKW, station trustee. Traffic: (Feb.) K0CNC 41, ITP 32, KJR 26, W0DNJ 14, K0IAB 11, ADI 10, GGL 10, AZX 9, W0CAQ 6, K0JLW 5, LBD 5, GGI 4, OLM 4, PLY 3, W0HVM 2, K0MHB 2.

SOUTH DAKOTA—SCM, Les Price, W0FLP—Asst. SCM: Gerald F. Lee, 0YKY. SCM assistants: FKE and NEO, SECs: YOB and GDE, PAM: SCT, RM: K0BQM. The 75-Meter Phone Net, which meets daily at 6:30 P.M. CST and Sun. at 9:30 A.M. CST on 3870 kc., reports 32 sessions; K0BQR 4, GWA 4, CTZ 3, EXX 3, K0DUR 4, K0BQM 1, YVF 3, SCT 10; QNI 991, high 45, low 13, average 31; traffic 101, high 9, low 0, average 3.156; informals 127, high 17, low 0, average 4. The SD 40 Meter Net which meets Mon. through Sat. at 12:15 P.M. CST on 7227 kc., reports 24 sessions, K0LXF 16, SCT 8; QNI 478, high 25, low 14, average 19.91; traffic 80, high 11, low 0, average 3.33; informals 81, high 7, low 0, average 3.375. The SD C.W. Net, which meets Mon., Wed. and Fri. on 3645 kc. at 7 P.M. CST, reports 12 sessions, K0BYM 8, K0DYR 3, SCT 1; QNI 79, high 8, low 5, average 6.5; traffic 20; informals 9. The SD Weather Net reports 24 sessions; QNI 368, high 22, low 10, average 1.58; QTC 354, high 20, low 10, average 14.8. The S.S.B. 75-Meter SD Net reports 26 sessions; QNI 701, high 38, low 17, average 26.9; QTC 23, high 5, low 0, average 9. The S.S.B. 75-Meter SD Net reports 30 sessions; QNI 634, high 31, low 14, average 21; QTC 22, high 5, low 0; informals 67. Recently K0PMM, K0LXH and K0OXU visited K0AIW and made some improvements in his station for him. K0BYV and wife looked up SCT Feb. 1, but found no one to greet them but the dog, EXX, GWA, ZYV, K0EWJ and Don Heins were among visitors at the Sioux Falls ARC auction Feb. 2. The PDARC meeting at Yankton was devoted to rewiring the connecting rack of an SCR-322 2-meter transmitter and receiver unit, building a power supply, and getting the receiver to work. A new net member is K0LKH. Crystal-controlled on the North Dakota frequency, he

(Continued on page 130)

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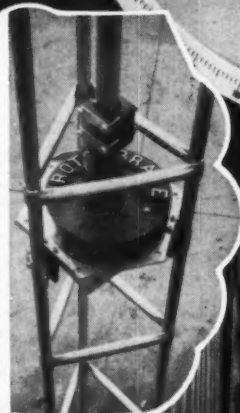
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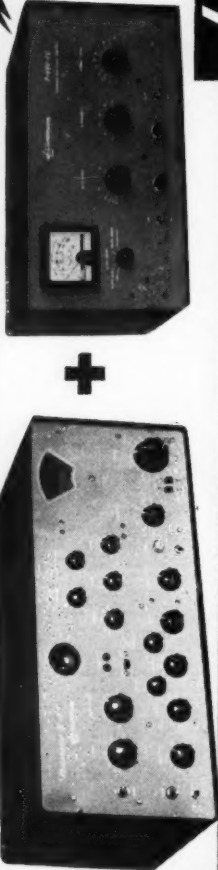
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has been loaned an SD net crystal. K0LXH obtained a Viking II with a damaged case at a very low price and had it on the air the same day. Among the many new hams from the Sioux Falls ARC classes is the granddaughter of DIY with the call KN0RWO. Traffic: W0SCT 272, ZWL 248, K0ARF 160, BMQ 124, BMQ 124, W0DVB 73, NEO 48, ZLB 29, CTZ 25, K0AIE 22, DZG 21, LKH 20, BYV 19, RKJ 14, DYR 12, DHA 11, W0YBF 11, FJZ 10, KLR 9, LXH 8, W0WFP 8, K0TKU 8, CWJ 6, W0DKJ 6, TRU 6, AZJ 4, K0MML 4, MTZ 3, W0EWJ 2, K0IAW 2, W0NNX 2, K0OMP 2, PQW 2, JAB 1.

MINNESOTA—SCM, Lydia S. Johnson, W0KJZ—Asst. SCM, Rollin O. West, SEC: TUS, RM: K0GCN. PAMs: QVR, TCK and TUS. This section salutes our former SCM, KLG for a job well done! The first WAM certificate goes to K0MNY. New ECs are HPN and K0OIW. GTX, PBV, PRJ, RVO, LUP, YNY, K0JCF and KEJ had their EC certificates endorsed. HEN earned an OPS certificate after a record 59 check-ins in two months. New Novice, KNTEC in Kokato, is on the air using a Globe Chief 90-A. K0RYK moved to Jasper. WMA kept a daily schedule for two weeks with K0GFAE, handling traffic between a Cokato family and their son, a Navy lieutenant, and his paralyzed wife. ZOB and his wife with their daughter (airline stewardess) vacationed in Hawaii. LUP spent his vacation building a tower and a beam. The St. Cloud Hamfest will be held Aug. 9 at Wilson Park. The new officers of the St. Cloud Radio Club are RVO, pres.; SV, treas.; ZCA, secy. KNRRK, of Duluth, has worked 46 states with 42 confirmed. K0GOX visited KLG. Litchfield hams K0JNX, ILZ and ZQB are handling phone traffic. Six Little Falls stations check into the phone net. They are BNA, NYM, K0MPG, OIU, QEQ and QEK. The first Minnesota visually handicapped operator to go s.s.b. is K0AEE. Little Falls High School Club station LYG is active on 40-meter c.w. LUX, of Winona, spoke and showed colored slides of his DXpedition to the Galapagos Islands at the SPIC and MARC in the Twin Cities. GBG and his wife are spending the winter in Arizona. The Highland Park Junior High School, St. Paul, has a newly licensed amateur radio station with the call K0SS. Our sympathy goes to the family of K0JYA, who has joined Silent Keys. Traffic: K0IDV 318, ORK 210, W0KJZ 206, K0EWC 95, W0TUS 72, KLG 68, K0MGT 42, W0TWG 42, UMX 39, K0RYK 36, W0PXP 36, OJK 35, K0GCN 32, IZD 28, W0KFN 28, K0EPT 27, MAH 25, W0NNX 22, ALW 21, K0MJ 21, W0LST 20, QVR 20, RIQ 19, KYO 18, PET 18, OJG 16, WMA 16, K0MPG 14, W0BUO 12, TCK 11, FPG 10, HEN 9, K0HJC 8, MNY 8, OIW 8, QEK 7, W0OOU 6, RHI 6, OET 5, QXF 2. (Jan.) K0MNY 20, W0HEN 8.

DELTA DIVISION

ARKANSAS—SCM Ulmon M. Goings, W5ZZY—SEC: K5CIR. PAM: DYL. Sgt. Jack Fowler, K4LYY/5, of Blytheville AFB, has been transferred to DLA-Land. K0JHY/5 has been transferred to Joplin, Mo. YHT is working portable in Fayetteville. He is studying electrical engineering at U. of A. W7BED/5 has received his new call, K4TYW, and has been appointed as RM for Arkansas. K5HSJ is building an electronic keyer. BM is now at Biloxi, Miss. working with Keeler AFB. 6BMM/5 still is continuing his classes in code practice and theory at Monticello. Interest continues and some of the boys are getting along fine. IAI, of Lake City, is operating portable in Texas. ZZY wishes to express appreciation for the sympathy and kindness shown him by the many amateurs during the illness and passing of his mother. Traffic: (Feb.) K5IPS 336, H5J 118, TYW 118, W7BED/5 54, W5CEU 22, ZZY 16.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—SKW, Lake Charles Area EC, is doing a bang-up job with his 32 AREC members and 3 Asst. ECs to help. INL, Westside New Orleans EC, holds weekly drills on the air with 18 AREC members. K5EFS, EC for Rapides Parish, has a going organization with 12 full AREC members. K5ZIT who took over the EC job from K5MMP when he was transferred to Houston, is getting things rolling in the Shreveport-Bossier City Area. During a recent telethon held in Lake Charles, the Amateur Radio Club of Southwest Louisiana, through its base stations and mobiles, helped in the collection of donations. K5JCQ was the organizer who worked with the local Optimist Club which sponsored the program featuring George DeWitt of TV's "Name That Tune." Those participating were K5JCQ, LKX, ARH, IZB, BQT, CTQ, CRE, GSI, CXB, MMQ, MQM, ESN, PYN, PPK, W5BZW, UJP, SKW, K4MFN and K7GXU. The Net mgr. for the SWLA Emergency Net is KRJ. The net meets each Sun. at 2 p.m. Jefferson ARC officers are QHP, pres.; GAD, vice-pres.; K5HEK, treas.; IZD, secy. CEZ made BPL again. CEW, who has 257 countries worked and 246 confirmed, has 156 countries confirmed on phone. KRX is active on 75- and 80-meter

(Continued on page 132)

What is a Mercury Battery?

How does this battery differ from zinc-carbon batteries in construction and performance?



Mercury batteries are ideally suited to modern trends toward miniaturization such as vest-pocket portables, hearing aids, instruments, electric wrist watches, and military equipment.

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The mercury battery—a mercuric oxide, alkaline primary cell—was invented during WWII, and developed by P. R. Mallory & Co. Inc. Chemically, this battery consists of a depolarizing mercuric oxide cathode, an anode of pure amalgamated zinc, and a concentrated aqueous electrolyte of potassium hydroxide saturated with zincate.

Mechanically, the cathode and anode are pressed shaped structures which are assembled into a steel container. Currently, there are two basic physical designs—the flat, button-like unit, and the cylindrical unit resembling an ordinary pen-light battery. Both structures are self-venting for protection against circuit abnormalities such as shorts or reverse currents.

Longer shelf life is possible because deterioration during inactivity is minimum. This is important where batteries must be installed in equipment which operates at widely separated intervals or only in case of an emergency.

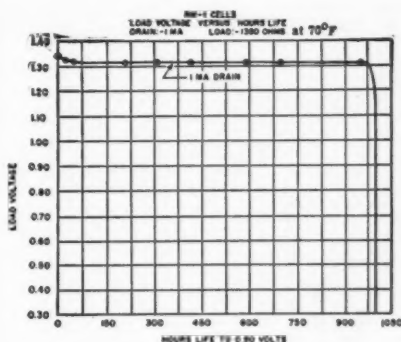
When used at current drains within design specifications, no "recuperation" is required to maintain a mercury battery's efficiency. The most important electrical feature, however, is the mercury battery's constant voltage. The measured potential of this battery, under a given set of conditions within its ratings, stays substantially the same to the end point of its life. (See performance curve.) Over long periods of time, voltage regulation within 0.5% is maintained—for shorter periods, regulation of

0.1% may be realized. This enables the use of these batteries in such services as a reference point in a regulated power supply, computers, and other critical circuits.

Mercury batteries have an exceptional ability to withstand severe shock and acceleration, and have extremely high resistance to moisture and corrosive conditions. Momentary short circuits will cause no permanent damage, with almost complete recovery to full open circuit EMF within minutes. Excessive load currents cause no damage, with almost immediate EMF recovery.

Mallory Mercury Batteries are available through Mallory distributors. For those who desire more complete engineering information, a copy of the Mallory Technical Data Bulletin on Mercury Batteries may be had by writing me in care of the Mallory Ham Shack, P. R. Mallory & Co. Inc., P. O. Box 1559, Indianapolis, Ind.

Lem Temple, WIDI



A typical mercury battery performance curve showing voltage vs. life. Note the constant potential to the end.

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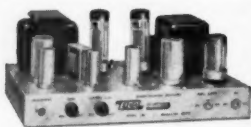
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c.w. handling traffic. K5DMA reports the Carville project is going strong with 4 new Novices in the making. MXQ has a nice traffic count. MO, in the process of building a new secondary standard, is having a time constructing a good crystal oven. Apply to your SCM for ARRL appointments. Check expiration date of present certificates and mail them in for endorsement. Traffic: W5CEZ 547, MXQ 210, KRX 88, K5DMA 14, W5EA 8.

MISSISSIPPI—SCM, John Adrian, Houston, 87. W5EHH—K5HQ reports that the MMEN held 24 sessions in February and handled 32 pieces of formal traffic. The Biloxi ARC gave an appreciation supper for Treasurer ISV, who is leaving the coast to work for Collins in Dallas. The new treasurer is K5LUX. The Biloxi Hamfest will be held June 6-7 at the Biloxi Community House. First prize will be an Apache and an SB-10; second will be a Tribander beam and a rotator. New members to the club are HAV, FBW, 3AXI and 4AWC. K5DXL has an emergency set-up at the Natchez Electric Power Assn. for emergency use. CQJ is going strong on s.s.b. ZNY recently moved from Cleveland to join our neighbors in Eudora, Ark. K5BGG is in Alabama training for instructor's rating. We regret very much to report the passing of PFC, a real friend to many hams who knew him on the air and in person. Our deepest sympathy to VQE, his wife and PFD his son. Traffic: K5QNF 392, QNE 125, MFY 17, W5EHH 14, BW 6.

TENNESSEE—SCM, R. W. Ingraham, WAU10—We welcome PL back on the reporting list. Congratulations to BPL winners: PL (twice), 5RCF and K4LLB. PL reports a sick spell and that the NC-300 is the best c.w. receiver he has ever owned. IFN reports the following news from the Jackson Radio Club: TBS is portable with a DX-35; COY is planning high power; FWV is s.s.b. with an SB-10; RHO is trading his a.m. final for s.s.b. linear; JRD/KS4 is looking for Milan and Jackson at 1800 CST on 14.230 and 14.260 kc.; IFN is busy with club duties. ZJY sends regards to all from France. YRM reports 6-meter DX with HCIF5. OGG says he is NCS on Tenn. Phone, 5RN and CAN. FEP has converted a Valiant to run 60 watts on 6 meters. K4LLB says he hopes to be on RTTY soon. VNE reports that he has completed WAZ after 25 years effort. K4ILU has a 'scope hooked up to his receiver and is active in OO work. Traffic: (Feb.) W4PL 1475, W5RCF 912, W4OGG 410, K4JNK 254, LLB 85, W4DMS 84, CXY 67, VJ 50, IGW 38, UVO 35, PFP 31, PAH 27, NHT 25, PGP 22, JYM 17, UVL 16, K4KYL 12, OUK 12, W4TZW 11, TDZ 10, EIN 8, K4ILU 6, W4LLJ4, PSN 4, (Jan.) W4PL 488, K4LLB 110, W4FEP 9, (Dec.) W4PL 827, K4LLB 417, W4VNE 14.

GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thomason, W4SUD—Asst. SCM: William C. Aleock, 4CDA, SEC: BAZ, RMs: K4AIS and LHQ, PAMs: GTC and K4MMW. S.S.B. PAMs: K4HIF and K4LOA. K4LOA, YZE topped the February Kentucky QSO Party taking home a Johnson SWR meter for his efforts. Another contest is scheduled for June, with a Q multiplier (contributed by Heath Company) as first prize. Suggestions on new rules are invited. Full details will appear in May Kentucky Ether Clippings. A diagram to your SCM will insure you a copy. February OO reports were received from ELG, K4GAG, GEZ and RUB. EJA is a new OO. PAM GTC reports that 1690 CST KPN is doing very well. RHZ helped with St. Louis tornado traffic. K4CC has a new 32S1-75S1 working all the section nets. K4HTC is working with ham-to-be Scouts. KKG says "QSO Party fun—what's next?" KAPNA has an HQ-170. KIN has shoes for his 10A. He hooked everything in the shack (including brother KIO) to the new Drake. K4LOA reports Warren County should have 13 stations on 6 meters soon. OES SPJ is awaiting his Conditional Class license. ELG has a new QTH. OBS NRH is active. K4AIT is back at Ga. Tech. HTD and K4SBL are QRL school. IFB was active in the DX Contest. Traffic: K4AIS 328, W4BAZ 234, JSH 163, K4ZLM 159, W4SUD 155, K4VDL 148, CSH 137, W4KKG 123, K4CS 112, W4RHZ 104, GTC 98, K4SBL 97, MMW 93, WRBG 72, QCN 66, W4NGN 65, K4IFB 58, KIN 55, W4CDA 51, VYI 51, K4LHQ 44, W4SZB 39, OGY 38, K4JOP 33, PNA 32, MPV 31, QHZ 25, AIT 24, VTY 19, QCO 14, QYP 13, HCK 12, W4HTD 12, EJA 9, HOJ 8, K4KIS 8, W4SZL 6, ELG 5, K4KYZ 5, W4JUI 4.

MICHIGAN—SCM, Thomas G. Mitchell, W8RAE—SEC: YAN, RMs: OCC, FWQ and QQO. Field Day seems to be the next large order of business for the fraternity. Reports of the last FD operations are just fading and now we are preparing for the next one. Lots of luck to all participating units. Examination will disclose quite a few new calls listed in the traffic report this month. It is gratifying to see them listed and their presence is appreciated. RTN is QRT for a tour of Army

(Continued on page 134)

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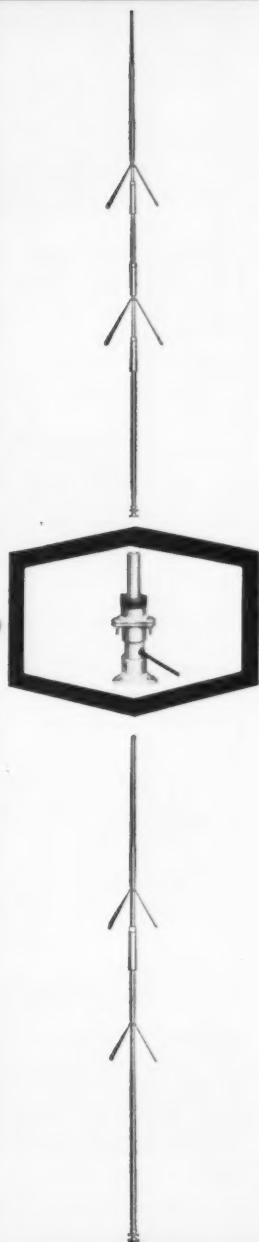
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duty. K8CKD is conducting code and theory classes at home two nights each week for fellows in the Ludington Area. QIX is undergoing eye operations for the removal of cataracts. HKT still is climbing the DX ladder. The Niles Amateur Radio Club has elected the following new officers: LZZ, pres.; JFF, vice-pres.; QBE, secy.; and NLO, treas. The Holland Area Radio Club published the first issue of its bulletin, *SPARK GAP*, as of February, with DYI as editor. Congratulations to MGQ and MMB, who were "coupled" on Feb. 5. May their "QSO" be long, happy and QRM-free. As mentioned in this report last month we were to have had a new SCM by this date. Because of some technical difficulty, the election has not been announced as yet, so I will continue in an acting capacity during the interim. As soon as the selection is made, I will see that the word is circulated via the established nets. Traffic: (Feb.) WSOCQ 260, QQQ 183, FWQ 147, K8KVV 146, W8YAN 138, NOH 135, JKK 119, FX 105, K8HVQ 96, W8SCW 66, RTN 63, K8NAW 35, AXL 30, W8MHZ 29, ILP 27, DSE 24, K8CKD 23, W8AUD 21, WXXO 20, RAE 16, WVL 16, K8AEM 15, W8ALG 9, HKT 9, QIX 8, K8ABW 6, GJD 6, W8MMI 6, SJF 4, TIC 3, K8KMQ 2, W8EGI 2. (Jan.) K8HVQ 63, W8NUL 20, K8AXL 17, CKD 17, GJD 17, ILB 12, W8FSZ 7, K8BTH 6, KMQ 2. (Dec.) W8AHV 19, K8CKD 18.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE. SEC: UPB. RMS: DAE and VTP. PAMs: HPP and HZJ. AQ worked EI, SM, KH6 and KL7 on 30 Mc. HZJ has a new Mosley Trapmaster beam. BZX has a new HQ-110. THJ is in Florida. MJC and K8GVV have new three-element 10-meter beams. JHJ and KLD were in the hospital. RO now has an SX-96. KN8LCZ and KN8LDA are man and wife. K8s: MZS, MZT and NLI were in California. The Seneca RC's 1959 officers are K8BCK, pres.; and Ken Hydman, secy. K8HZN received a W5 certificate. Those who aided during the January flood at Steubenville were YV, D, E, ERR, JN, OBO, ZRI, ZWH, K8s BYF, DTD, GEH, GHN, HMJ, LQM and NAM. Those in Henry County who participated during the flood were UPLM, SMW, FDK, QCL, K8s ESU and MHO. Those in Seneca County who helped were WAB, JWD, IJL/M, RBT/M, SWL, VKB/M, CUZ/M, GJL, POH, FYW, SGT/M, K8s BCX, BIL and KN8LCZ. In the Cuyahoga County Area the following were active during the flood: AEU, ANB, ASW, BAH, BDZ, BHR, BFN, BTQ, CPP, CZM, DOK, EPB, ENB, EEM, FAG, FAT, FEZ, FOM, HEG, IDM, IY, KEK, LFY, LHX, LMF, MDL, MPP, MVU, MWE, NZD, NZI, OIS, OXS, OXY, OYS, PBZ, RAE, SLE, SQU, SZU, TFW, TXZ, UEM, UKW, VFU, WZS, ZEP, K8s AAG, AAP, ABA, BWH, CDA, CFH, CTI, DBF, DBJ, DKU, DPA, DOB, DZY, GBH, GCF, GJW, GVK, GZY, HCS, HSI, HVH, IHC, IJG, IKA, ILX, IMF, IPS, JHG, JHZ, JJC, KBE, KKO, KKP, KNH, LMF, LMV, MBU and W3JTY8. Our recent flood emergency brings my plea again for need of 24 in Ashland, Brown, Carroll, Champaign, Clinton, Defiance, Delaware, Erie, Gallia, Hancock, Hardin, Harrison, Holmes, Huron, Marion, Monroe, Morrow, Paulding, Perry, Portage, Preble, Sandusky, Scioto, Union, Vinton, Warren and Williams Counties. Please volunteer and write to your SEC, D. E. Cartwright, UPB, 2979 Observatory Ave., Cincinnati 8, Ohio, for information. The Xavier Univ. R.O.T.C. RC's 1959 officers are K9OQC, pres.; MWY, vice-pres. AUV, corr. secy.; and QIZ, res. secy. The club call is K8WBL. Lake-Geauga County ARC's 1959 officers are OED, pres.; MFT, vice-pres.; and QKX, secy-treas. The club meets the 1st and 3rd Mon. of the month and has a code class for Novices conducted by IMH and FKP. DNC was named Canton ARC vice-pres. in place of K8HED. K8DHJ received the WTPA award. AL received WFRG and W-Del. K8JPA has a new Valiant. Columbus ARA's *Carascope* states that THU showed how to build a crystal calibrator. K8DDT went to Florida. IOV has his General Class ticket. Toledo's *Shack Gossip* names ESN as it's "Ham of the Month." KN8NGH is a new ham, QCT is on 6 meters, SUT is in the hospital, KIX is at a Naval Base in California, OSD, the daughter of QOV, married K8BYT. The Tusco RC reports that GAC spent two weeks at Ohio Bell School in Columbus. FMW and GAB have a new SP-600JX receiver. JHJ was named president of Tusco as K8JZ's working hours made it impossible for him to attend. DAE and UPH made RPL. New appointments: WNJ as EC and K8HRR as OES. The Greater Cincinnati ARA supplied amateurs in the area with a real complete amateur directory. WXXG is head of the Red Cross in Springfield. TZO completed his Seneca VHF-1. LT is on 6 meters with a 6N2 and an NC-300 with converter. QCU is 6-meter mobile with a Little Gem and a Saturn. EEQ has a Globe Scout for a stand-by rig. K8HHQ has a DX-40 and an HQ-140X. IBX received OHA award No. 1001. K8CZJ is home from college. Akron's BSRA started a code class with 75 pupils and

(Continued on page 138)

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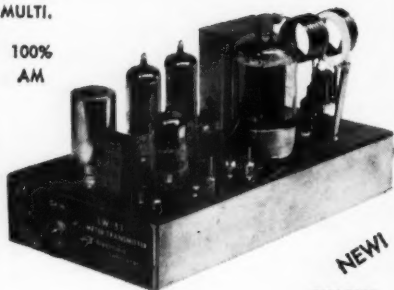
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recently graduated a class of 18. Traffic: (Feb.) WSUPH 1376, DAE 536, AL 391, K8CZJ 312, W8SZU 216, IBX 173, K8DHJ 116, W8QLJ 88, YGR 84, K8KEG 53, W8GQD 30, BEW 28, K8DDG 26, W8WE 24, SYD 18, QIE 17, K8HDO 15, W8STR 14, HUY 13, PLQ 10, BZX 7, LT 7, WYS 7, DDW 6, HPP 6, K8JIX 6, W8LMB 6, LGR 4, QCU 4, PSX 3, K8IFV 2, JZZ 2, KRQ 1, MSI 1. (Jan.) WSPMJ 75, K8IHT 42, W8EEQ 17, AQ 2. (Dec.) W8SMW 6.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC, RM: W2PHX, PAMs: W2LJG and W2NOC. Section nets: NYS on 3615 kc. at 1900, NYSFTEX on 3925 kc. at 1800, IPN on 3980 kc. at 1530, ESS on 4590 kc. at 1800, ENY (emerg.) on 29.490 (Thurs.) and 144.35 Mc. (Fri.) at 2100, MHT (Novice) on 3716 kc. Sat. at 1300. Congrats to our three BPL certificate winners: K2UTV, K2TEZ and WV2ATC. New appointment: W2ZBS as OO. An NYS Net certificate was earned by K2MBU. Officers of the Yonkers ARC are K2MQR, pres.; K2HGN, secy.; K2BFU, treas.; K2BIG, editor; W2LWK, tech. advisor. The talk on "Oscilloscopes" at the club's February meeting drew a large crowd. New General Class licensees include K2ETC, K2HIX and K2SIL. WV2CQM has a new Ranger. A higher-powered rig is under way at WV2AKK. Two new 6-meter stations in Poughkeepsie are W2ROE and W2ADAP. K2CVG reports 23 states on 6 meters. On the DX side, 58/28 is the score at K2YTK. K2KUA has a new 25-w.p.m. sticker. W2AMJ, OF Hammarlund, was guest speaker at the Schenectady Club meeting. The Yonkers Kiwanis heard a talk on amateur radio by K2BIG. We are sorry to lose W2ZK, who is moving to Owensboro, Ky. See page 11 of this QST for an article by W2RDL and W2UKL, who established a new DX record on 21,000 Mc. last fall. Both are members of General Electric's Research Lab. W2PHX and K2UTV are net controls on 2RKN. New Ellenville Club officers are K2LUS, pres.; K2KRP, vice-pres.; K2OCH, publicity. Ulster Co. has a new 6-meter RACES Net. K2YCJ is the club call of the Communications Club of New Rochelle. K2VLI says a transmitter hunt will be held Apr. 4 on 145.38 Mc. Traffic: (Feb.) K2UTV 1101, K2TEZ 1002, K2YZI 297, K2UYK 183, K2MBU 171, K2YTD 151, WV2ATC 112, W2ATA 89, W2EFU 86, W2PHX 29, K2BIG 24, K2GKK/2 22, WV2AKK 18, W2FVP 18, K2CKG 13, W2ZBS 6, K2BAB 4, W2TYC 2. (Jan.) W2ZBS 12.

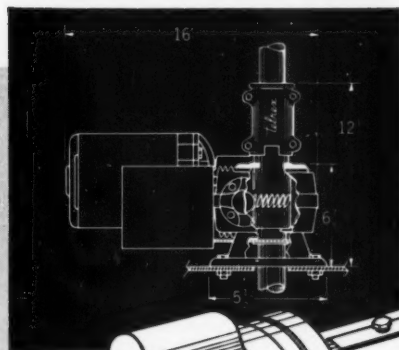
NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannels, W2TUS—SEC: W2ADO, RM: W2YDT, PAM: W2UGF, V.H.F. PAM: K2EEH. Section nets: NLI, 3630 kc. nightly at 1930 EST and Sat. and Sun. at 1915 EST. NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EST. NYC-LI AREC, 3908 kc. Sun. at 1730 EST. V.H.F. Traffic Net, 145.8 Mc. Tue. through Sun. at 2000 EST. BPL cards were earned by W2KEB and K2QBW, the latter on origins plus deliveries. New officers of the Fortham RC are K2JVB, pres.; K2QOB, vice-pres.; W2QX, secy.; K2OF, corr. secy.; and K2QBW, act. mgr. K2KXT received his CP-35 certificate and the traffic total is soaring. W2BO soon will be off on a trip to KH6-Land. W2DRD is now sporting a new HQ-170. The Columbia URC added a new 6 meter four-element beam. K2HVV completed his surplus-converted mobile for 75 meters and MARS. The Manhasset c.d. station added 28- and 220-Mc. gear. W2LQK enjoyed working the YL-OM Contest. W2DID is now operating his 75-watt mobile rig on 75 and 10 meters. For those who wonder if 6 meters is active, the following figures are quoted for February from the 6-Meter L.I. Emergency Net, courtesy of K2VIK: 95 different stations reported, 61 stations average per session with 71 high and 49 low. W2PVQ is using a 16-ft. 40-meter "Wonderbar" with good results. W6GGP is mobilizing in our section looking for contacts. K2OEG picked up Asia for his last continent. K2OFD passed the General Class exam and is using a Knight receiver. New Equipment for 220 Mc. has been added at K2SVY. K2TMI keeps daily skeds with the Texas Tower Net. W2AQQ is looking for anyone interested in fax work. WV2COG received the 1st-class radiotelephone license at the age of 13! W2OTA's XYL signs WV2DTZ and is active on 2 meters with 75 watts and the low frequencies with an Adventurer. K2YDR completed an EICO 720 rig with 730 modulator K2RBS announces a "6 Meter Needle Net" certificate for anyone contacting charter members W2LAW, K2RBS, K2RCP and W2BRY and abiding by the rules of the net. Contact any of the boys for exact details. K2HGR reports the formation of the Bayside ARC with a club frequency of 28.8 Mc. All amateurs in the Bayside-Flushing Area are invited to join this new group. A new call heard on 6 meters is W2BCH. W2GIE reports successful contact with his brother, VQ5FS, after a long wait. A Globe Champion 300 and SX-96 did the trick. W2DCQ received his General Class

(Continued on page 138)

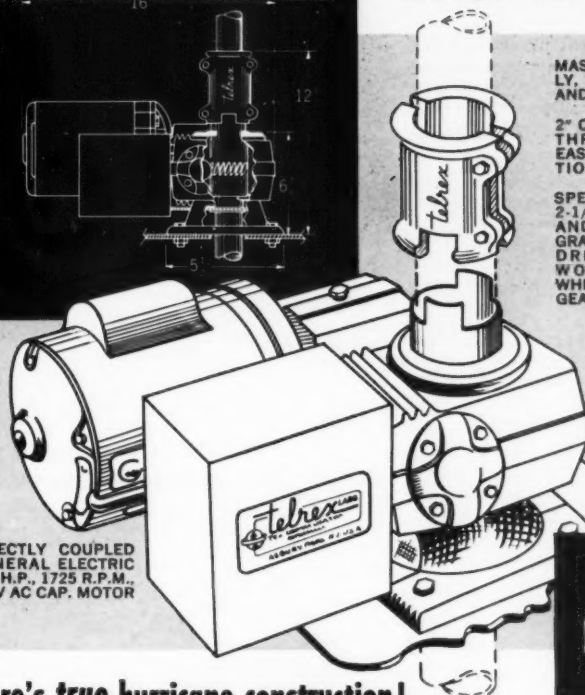
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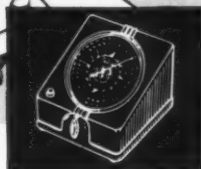


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ticket and CP-20 endorsement. Excellent club newspapers were received from the NYRC, Levittown ARC, Fordham RC and the Amateur U.H.F. Club. Thanks are extended to these clubs and a request is made for other clubs to send their news each month. All appointees are urged to check their appointments for renewal. Traffic: (Feb.) W2KEB 3687, K2QBW 414, K2KXT 293, W2VDT 249, K2VCO 190, K2UBG 135, K2IRS 119, W2EW 86, W2BO 82, K2MIG 45, W2DRD 43, W2AEE 42, W2GP 34, W2BQ 34, K2BH 28, W2DUS 28, K2JVB 28, K2HVV 26, W2UJA 20, W2LGG 18, W2DSC 15, W2PPE 12, K2MIS 10, W2DID 9, K2MYS 8, W2EC 4, K2PHF 3, K2VIX 3, W2KQX 2, K2VDR 2, W2PVQ 1, K2RBS 1. (Jan.) K2HVV 35, K2YQY 25, K2MYS 6.

NORTHERN NEW JERSEY—SCM, Edward Hart, jr., W2ZVW—SEC: W2IIN, RMs: W2RXL, W2ADE. PAMs: K2KVR—u.h.f., K2VAC—NJPN. The New Jersey Net meets daily at 1900 on 3695 kc. Manager W2RXL reports an average attendance of 17.9 stations with 12.35 messages handled per session. The net bulletin is sent to all members. The New Jersey Phone Net meets on 3900 kc. at 1900. W2JAX made BPL and gives credit to the NJSS Net, with a big assist from K2ZHK. This may be the first Novice BPL in the Northern New Jersey section. K2MFF took a crack at the F.M.T. K2AGJ continues his fine code lessons on 2 meters. K2ZSQ made 20-w.p.m. CP. W2NIY was the first in New Jersey in the Mass. QSO Party. K2EQP had trouble with the rig, but all is well. W2DRV is on the night shift and spent some time in the hospital. W2RON is working on a regulated light beam. W2TSQ spends time on MARS. The Rutgers University ARC's officers are W2BVE, pres.; K2KLR, treas.; W1BPW, secy. W2BVE is working on RTTY. W2EWZ received a Worked New Hampshire award. W2GVU will retire from the Army May 31. K2VVL has the tower and tri-beam back up. K2VAB is working DX and snagged L2ZFN. K2GIF is back on with a p.p. 813 rig. W2OPB is NCS for the Eastern States Net. K2TXE now is General Class. W2PTS is a new OIS in Plainfield. K2UMH has a new 2-meter v.f.o. W2CVW worked 94 countries. K2BPP has a new converter using 417A. K2UKQ needs one card for DXCC. W2GKG and W2LAN assisted the local police when their radio went dead. The New Jersey Slow Speed Net had 20 sessions with an attendance of 36 and handled 98 messages. Traffic: (Feb.) K2ZHK 344, W2OPB 191, K2VVL 182, K2VAB 153, W2RXL 121, W2QGB 110, W2JAX 108, K2ZVW 105, K2EQP 75, K2AGJ 74, W2RZO 46, W2CVW 41, W2EBG 40, K2MFF 35, W2KFR 31, W2BRC 16, W2ADE 14, K2KVR 10, K2GIF 8, K2JTU 7, W2RON 6, W2BVE 4, W2TSQ 4, W2WOJ 4, K2ZSQ 3, W2CJX 2, W2DRV 2, W2NIY 2, K2UKQ 2, K2VLU 2, W2EWZ 1. (Jan.) K2YJH 17, K2VAC 12.

MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, W0BDR—QVA was re-elected president of the Burlington Club with K8AFN re-elected secy.—treas. and DRY elected vice-pres. The Central Iowa Club re-elected K0GVG, pres.; SLC, vice-pres.; and EFL, secy.—treas. New officers of the Grace-land College Club are K0DPF, pres.; 8QOE/#, vice-pres.; and Florence Harper, secy.—treas. New officers of the Cedar Valley Club are DGF, pres.; LPK, vice-pres.; R. Weeks, secy.; and K. Roland, treas. K0LRK is the newest member of the TLCCN. EXN received an OPS appointment. Renewals: BRE and MJH as EC and SLC as OPS. QVA is starting a new code and theory class for prospective amateurs. ZYB is building a new shack and tower at a new QTH. EEG and KJN vacationed in the South. The RACES party for Sioux City has been approved by the State and has been forwarded to Washington. The annual TLCCN Party is planned for the latter part of May. Traffic: (Feb.) W0BDR 2655, LGG 1369, LCX 1160, SCA 1116, PZO 565, CXQ 302, K0CLS 198, GXP 124, W0QVA 75, K0AGJ 60, W0BLH 57, UTD 50, K0BLJ 48, W0SLC 45, K0APL 32, W0NTB 28, K0MMZ 25, W0NYX 25, K0EXN 23, W0FW 23, K0QKF 22, BRE 21, DON 21, W0JPJ 21, BTX 19, NGS 19, K0CLI 18, W0LSF 18, BQJ 17, K0GBB 16, GOQ 16, W0LUZ 16, RQA 15, K0GOT 14, W0VXN 14, K0EYX 12, W0GQ 12, K0LHH 12, IDN 11, K0MFX 10, RZO 10, W0HUO 10, K0HBD 9, KAQ 9, W0SWD 9, AYD 8, HTP 8, K0BPR 7, IHC 7, W0EEG 6, K0LBZ 6, QVZ 6, W0YDV 6, BRT 5, III 5, K0KBB 5, OFK 5, K0QWM 4, W0COD 3, FMZ 3, K0JTL 3, W0ADB 2, K0HFQ 2, W0PTL 2, FDM 1, QVZ 1. (Jan.) K0LHH 9.

KANSAS—SCM, Raymond E. Baker, W0FNS—SEC: IFR. Asst. SEC: LOW. RM: QGG. PAM: LEW. V.H.F. PAM: HAJ. KSN went into operation Mar. 9 on 3840 kc. to track storms. All emergencies will be handled on the KPN frequency of 3920 kc. Sorry this report is not complete as SCM Baker is in the hospital but your SEC will do the best he can. The Federation of Clubs is well on its way with clubs lining up. Thanks to those

(Continued on page 140)

HEAVY DUTY MOBILE BASE MOUNTS

NEW!



MMW-3AE



MMW-3APS

Ebony Finish \$6.95 Polished Finish \$7.95
Ebony Finish, S. S. Hardware \$8.95
Polished Finish, S. S. Hardware \$9.25

**PROTECTS YOUR
MOBILE ANTENNA**



MMW-7



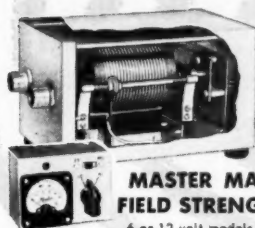
MMW-7SS

**NEW
HEAVY DUTY
MOBILE
SPRINGS**

MMW-7 Cad. plated,
black painted ends \$4.50

MMW-7HC Heavy Cad.
plated-Ex Protection \$5.50

MMW-7SS Deluxe
Stain. Steel \$8.95



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FIELD STRENGTH METER**

6 or 12 volt models \$24.95

FIBRE-GLAS WHIPS

The Feather-Weight Antenna with Spring-Steel Strength!

The completely weather-proof, breakproof antenna with special flexibility that prevents accidental shorting-out against overhead obstructions which sometimes cause loss of signal or serious damage to your equipment.

FG-60 60" .. \$4.95

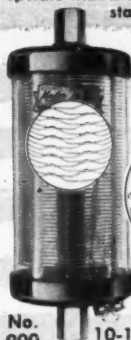
FG-72 72" .. \$4.95

FG-84 84" .. \$5.15

FG-96 96" .. \$5.20

NEW MULTI-BAND ANTENNA COILS

New Plug-In type coils for the Ham, designed to operate with a standard 3' base section and standard 5' whip



No. 900



No. 999

**YOUR CHOICE
\$14.95**

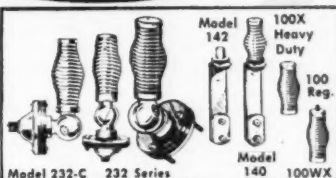
10-15-20 10-15-20-40-75 METERS

- Rigidly tested & engineered—found to have "Q" of 325
- Handles 500 Watts input
- Operates into a 52-ohm cable

- Positive contact—noise-free, trouble-free operation
- Weathersealed
- Factory pre-tuned—no adjustments needed

**Leaders in the
Design and Manufacturing of
Mobile Communication
Equipment & Antennas**

**No. 321
BODY
MOUNT
\$7.95**



MASTER-MAGIC WAND

New easy-to-install, single band, top-loaded plastic covered fiber glass mobile antenna provides maximum performance at the most useful radiation frequencies.

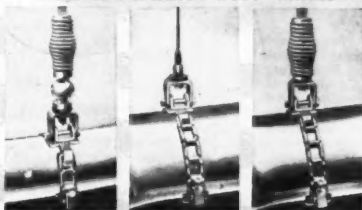
10 Met-5 Ft. L. \$12.95
15 Met-5 Ft. L. 12.95
20 Met-5 Ft. L. 12.95
40 Met-6 Ft. L. 14.95
80 Met-6 Ft. L. 14.95
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27.255mc ... \$12.95

SUPER HY-GAIN CITIZEN BAND

Citizen band mobile stacked coaxial antenna provides 5 to 6 DB gain. 42" high from ground plane. Furn. with 12" extension for bumper mount.

\$21.95

BUMPER MOUNTS WITH NEW X-HEAVY DUTY CHAINS



No. 444 \$17.80

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No. 446 \$13.45

Adjustable to any bumper. No holes to drill, easy to attach. High-polished Chrome Plated 3/8"-24 thread, to fit all antennas. Precision engineered.

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RADIO JOBBERS
EVERYWHERE**

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New VHF Mobile System

FROM THE "WORLD'S LARGEST" MANUFACTURERS OF
AMATEUR COMMUNICATIONS ANTENNAS

for 6 meters

High mechanical stability with minimum wind resistance made possible by 1" diameter tubing, heavy duty hardware, and high impact styron insulators.

Resonating capacitor completely weather-sealed in polyethylene cover and end assembly. THE FIRST ALL-WEATHER PROTECTED HALO.

Perfect match to either 52 or 72 ohm coax made possible through use of hy-gain's exclusive gammamax gamma match system. No external matching sections required.

Net \$12⁹⁵

Model HH-6

for 2 meters

Extremely small and light weight, weighing less than 1 lb., and only 14" in diameter, the 2M Halo is constructed of high strength heavy wall 3/4" aluminum tubing.

Adjustable over the entire 2M Band and providing up to 15 db gain over Vertical Whips when working other stations using horizontally polarized antennas.

Perfect match to either 52 or 72 ohm coax made possible through use of hy-gain's exclusive gammamax gamma match system. No external matching sections required.

Available stacked for additional 3 db gain. Stacking Kit for 2-Meter hy-gain Halo, complete with all hardware and matching sections. (Order two model HH-2 Halos). Model HHS-2 Net 3.00.

Net \$5⁹⁵

Model HH-2

for 6 & 2 meters

Unique hy-gain development permits combination of both 6 and 2 meter Halos to form high efficiency Duo-Bander Halo for operating either band with a single feedline and low SWR. Order both HH-2 and HH-6. Come complete with simplified instructions for assembly.

Eight ft. telescoping aluminum mounting mast complete with threaded stud for any standard mobile mount. For use with either 6M or 2M hy-gain Halo, stacked or single.

Model MM Net \$4⁹⁵

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who devoted so much time. Sorry we don't have HAJ's report handy as we know the v.h.f. boys would like to know more about what's going on. BBQ is the new EC for Zone 15. IHN is the new EC for Zone 12. A nice report was received from the EC on Zone 14. BZK, ATS and TTG are liaison to the Weather Bureau. Your SCM should be on the air by the time you read this. Traffic: (Feb.) K6GYA 452, W6FNS 165, QQG 159, SAF 153, SYZ 116, K6HIX 67, W6IFR 55, ABJ 48, K6KMZ 47, W6UOT 47, K6RL 44; W6VUI 26, K6JXV 25, JID 17, W6LEW 16, MMF 12, WIZ 9, K6HVD 6, W6LEA 6, VRZ 6, FHT 5, K6GIG 5, W6LIX 5, W6F 3, K6EFL 4, W6ASY 1, FHU 1. (Jan.) K6GYA 320, IRL 35, W6ASY 3.

MISSOURI—SCM, James W. Hoover, W6GEP—Net reports: MON; 3580 kc. 7 p.m. Mon. through Sat.; 48 sessions; QNI 261, QTC 261; NCSS, OUD 28, RTW 7, KBD 6, ONK 5, ARO 2, MEN; 3885 kc. 6 p.m. Mon., Wed., Fri.; 11 sessions; QNI 423, QTC 140; NCSS, OHC 4, OMM 4, VPQ 2, OVV 1. K6JPJ has added voice-control operation. K6OEP has a new 40-ft. tower and bean. K6OJC received WAS and 15-w.p.m. code certificate. WAP has been active on 147.12 Mc. with JUB. K6SGJ lost an eight-element beam to the Feb. 9 wind. New officers of the Aurora Radio Club are K6BII, pres.; UUG, vice-pres.; K6JIL, secy.; K6NSYN, treas. The Missouri School of Mines Radio Club station, EEE, is on 6 meters regularly. K6JZW has a new HQ-110. IBZ is on 40-meter RTTY after being inactive several years. K6JPL received a Worked All Connecticut Award. MNW, EC, and IGV, RACES RO, offered the services of AREC and RACES after the St. Louis tornado on Feb. 9, but amateur communications were not needed. Amateurs in the St. Louis Area handled numerous welfare inquiries as a result of long-distance lines being tied up. Those reporting include WFF 100, CPI 60, RTW 30, KIK 15, TPB 12 and WLC 10. I wish to express my appreciation to all of the individuals and clubs who have participated in ARRL Communication Department activities since I have been SCM. Your continued activity and support will help the new SCM, B.L., build a stronger organization. Traffic: (Feb.) K6ONK 1020, KBD 612, W6CFI 523, VPQ 327, BVL 193, K6JPJ 133, OEP 114, W6WFF 111, OUD 110, OMM 104, RTW 102, KIK 73, K6OJC 73, W6ARO 69, TBI 59, OVV 51, K6LZZ 17, W6BUL 16, K6LWX 16, IHY 14, W6KA 9, GEP 8, GBJ 6, K6IFM 5, W6WAP 3, K6SGJ 2. (Jan.) W6VZB 106, K6HIM 72, W6KA 8.

NEBRASKA—SCM, Charles E. McNeel, W6EXP—We are all sad to hear of the passing of MAO. Jerry was very active in amateur radio and Nebraska net activity and held several ARRL appointments. Jerry was PAM and NC for the Nebraska 75-Meter Emergency Phone Net. The Nebraska Morning Phone Net meets daily on 3980 kc. and K6DGW reports QNI 515 and QTC 134. Those reporting 100 per cent were K6DGW, VXJ and ZJF. There are 36 stations on roll call with K6KJL added. The Western Nebraska Phone Net meets daily on 3850 kc. and NIK reports QNI 604, QTC 50. The Nebraska C.W. Net reports QNI 165, QTC 58. Radio classes sponsored by the Blue Valley Radio Club are going strong with several new Novice tickets. On Feb. 14 the sideband boys from Great Bend and Phillipsburg, Kansas, held a sideband dinner at Phillipsburg which was attended by several of the boys from Western Nebraska. Traffic: W6ZJF 151, K6DGW 71, W6NYU 68, K6BDF 53, IJW 45, W6ZOU 44, NIK 39, K6KUA 36, W6KOK 36, IRC 26, K6HKL 16, W6RDW 16, VZJ 12, LJO 11, KLB 8, K6MSS 8, ELQ 7, W6ORR 7, VEA 7, EXJ 6, HTA 6, OCU 6, K6QLN 5, W6LEF 4, K6LXS 4, W6BOQ 3, ZNI 3, K6KJP 2, LLU 2, W6HOP 1, K6RRL 1.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Victor L. Crawford, W1TQY—SEC: EOR, RM: KYQ, H.F. PAM: YBH. V.H.F. PAM: EHP. Traffic nets: CN, Mon-Sat, 1800. Sun, 1000 to 3800 kc.; CN, daily 1800 and 2130 on 3640 kc.; CVN, Mon, Wed, and Fri, 2030 on 145.98 Mc.; CTN, Sun, 0900 on 3640 kc. KIAD and AW made BPL New Officers of the Stratford ARC are ASO, pres.; SBR, vice-pres.; Sam Burke, secy.; ZNU, treas.; TCW, comm. officer. KYQ advises that CN handled 546 messages, including 93 on the second session, during 28 sessions with an average of 10 stations. High QNI goes to KIAD, RFF and ROX. Retired VW is going on RTTY. KNIGB passed General Class exam. VXJ is assistant EC for Cheshire. FVY added 8 new countries for a total of 62. BFS has a new Apache. KIACC now has an 81 DX total. KICSY is pleased with his Apache ZYK is on a.s.b. UCA is building an a.s.b. adapter for his DX-100. YBH reports CPN handled 249 messages during 28 sessions with an average attendance of 27. QNI honors go to FHP, VQH, YBH, 28; DAV, 27; MWB, 26; KIBEN, MDB, 25; TVU, 24; KIAQE, 23. JID will spend the summer on Ice Island T-3. ZTY is mobile in a new car.

(Continued on page 142)

Transistor Power Supplies* and Components

* Complete Units

D SERIES (Standard)

Continuous operation at 30 watts. Selective taps at 200, 250 and 300 volts; intermediate voltage at 1/2 selective taps. Both voltages can be drawn simultaneously if total power does not exceed continuous ratings. Positive or negative ground operation. Input and output filtering included except for intermediate tap.

Size: 4 3/4" x 3 1/4" x 1 1/2" Wt.: 10 oz. 6- or 12-V Input: **\$39.95** 24-V Input: **\$61.95**

DA SERIES

Continuous operation at 45 watts. 450 volts and 225 volts simultaneous if total power does not exceed continuous ratings. Intermittent duty to 90 watts, 450 volts at 150 MA; 225 volts at 100 MA (5 min. on, 20 min. off). Positive or negative ground operation. Input (primary voltage) filtering; partial high voltage filtering provided.

Size: 4 3/4" x 3 1/4" x 1 1/2" Wt.: 14 oz. 12-V Input: **\$57.50** 24-V Input: **\$79.50**



Toroid Transformers for Transistor Power Supply Application

H SERIES

H-6-450-1 Input: 6-VDC. Output: 450-VAC center tapped... 450 and 225 VDC from bridge rectifier... 45 watts.

H-14-450-12 Input: 12/14-VDC. Output: 450-VAC center tapped... 450 and 225-VDC from bridge rectifier... 55 watts.

H-28-450-15 Input: 24/28-VDC. Output: 450-VAC center tapped... 450 and 225-VDC from bridge rectifier... 65 watts.

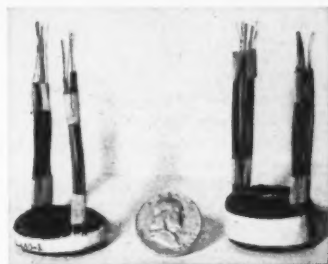
H-6-100-125-150-D Input: 6-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 100 MA.

H-12-100-125-150-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 125 MA.

H-24-100-125-150-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 150 MA.

Without Encapsulation (2 ozs.). 1-10 units: **\$16.00 ea.**

With Encapsulation (3 ozs.). 1-10 units: **\$18.50 ea.**



HD SERIES - 2000 CPS

HD-14-225-300-3-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

HD-28-225-300-3-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

Without Encapsulation (3 1/2 ozs.). 1-10 units: **\$18.50 ea.**

With Encapsulation (4 1/2 ozs.). 1-10 units: **\$21.50 ea.**

HDS SERIES - 2000 CPS

HDS-14-225-300-3-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

HDS-28-225-300-3-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

Without Encapsulation (3 1/2 ozs.). 1-10 units: **\$21.50 ea.**

With Encapsulation (4 1/2 ozs.). 1-10 units: **\$24.50 ea.**

400 CYCLE SERIES

14-115-1.3-400 Input: 12/14-VDC. Output: 115-V at 1.3 amp.

24-115-1.3-400 Input: 24/28-VDC. Output: 115-V at 1.3 amp.

Dim: 3" dia. x 1" thick. Without Encapsulation (12 ozs.).

With Encapsulation (16 ozs.). Per Unit: **\$76.00.**

Matched Pair HD Transformers

12/14-V operation—**\$11.00 per pr.**

24/28-V operation—**\$21.00 per pr.**

OEM Prices on Request

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A NEW CONCEPT—HI-POWER VHF LINEARS for 6 or 2 meters

Watts DC Input: 600 on 55B-CW-FM;
300 on AM-PM

- New BROADBAND untuned input circuit uses 6-watt drive for 600-watt input; for 50-70 ohms. • New output circuit gives approximately 20 db more harmonic suppression than any other in common use while matching antenna impedances between 25 and 300 ohms.
- New built-in TR switch uses gain and selectivity of output tuned circuit; has approximately 10 db gain, with one 12BH7A tube.



Excellent stability; No parasitics; TVI suppressed. By-passed RF final in shielded compartment. Designed to work with 600A, 200A, Gonset Communicators, etc.

- Built-in heavy-duty power supply furnishes 700 watts; excellent static and dynamic regulation. • Forced-air cooled PL4021A in class AB2; up to 60% efficient. • 6 db switchable attenuator for AM-PM (tune for max. input and output ... just switch in attenuator). • 3-position meter reads: (1) RF drive voltage input (tune exciter for max. input); (2) Final plate current (shows dc input to final); (3) instantaneous RF amps output (tune for max. output into antenna).

Special frequencies available on request.

Choice of grey table model (14½x10½x8½ in.) or grey or black rack models. Ship. wt. 50 lbs.

L600M or L200M ... tentative amateur net. \$289.95

Six Meter Transmitting Converter



A new heterodyne unit ideal for any low powered 14 to 18mc transmitter or exciter such as 20A, 10B, DX20, DX35, etc. Uses a 6U8 operating as 36mc crystal controlled oscillator amplifier and has an OA2 voltage regulator. A 6360 linear mixer amplifier in the output is tunable between 49 and 55 mc. Low impedance input of approximately 60 ohms; delivers up to 10 watts RMS output into any low impedance load between 25 and 100 ohms. Powered by separate power supply or in some cases by transmitter or exciter such as 20A or 10B. Requires 300 volts at 100 ma dc, 150 volts negative bias and 6.3 volts at 1.5 amp filament. Size only 5x7x7 inches.

- Model 600A Complete, less Power Supply. \$49.95
- Model PR 600A Power Supply for above. 39.95
- Model 600A-PR Complete with Power Supply. 87.50

LA-400 Series Linears—75 thru 10 meters

- LA-400-C Kit, complete for assembly. only \$149.95
- LA-400-B, same unit wired and tested. 199.95

V-F-O-MATIC Frequency Control

- 8020 for 75A-2, -3, -4 Collins receivers. \$129.95
- 8010 for KWS-1 75 thru 15. 179.95

High Power RF Choke—Model 160-6

Max. rating of 5000 volts dc at 2.5 amps. Inductance 162 uh at 1 kc. Operates on all amateur bands, 160 thru 6 meters. Each. \$3.50

Also chokes custom designed to your requirements.

See your distributor or write:

P & H ELECTRONICS, INC.

424 Columbia, Lafayette, Ind.

FHP advises CVN handled 12 sessions in 12 sessions with a total of 136 stations checking in. High QNI goes to KIBML, KIBMM, FHP, JZA, HJG, 12; KIHMM, 10; FPF, ZUG, 9; FDO, 8. The CQRC handled 8 messages during four sessions with 38 stations checking in. ZLV won a field-strength meter sponsored by Creative Electronics at a CQRC demonstration. URM is on s.s.b. LIG has the bugs out of his DX-100. EWK and ZGE are on with ARC-5s. CHR is back on CN. KKK is building 220-Mc. equipment. GWW joined MARS. SUZ worked HCIFs on 6 meters. IGG has a new NC-109 with converters. KICKZ built a 12AT7, 5763, 6146 rig for 6 meters. FOM worked QVF and FOR on 220 Mc. with 50 watts and a dipole in his basement. KIAOX is building a 2-meter s.s.b. rig. YOL, worked Vermont for No. 21 on 6 meters. KIBGG and KIEK are on 6 meters. KNIJTU is building a DX-40. EJJ has a new Viking Challenger. New appointments are KIBNQ and KIHMM as OBSs. KN'BNQ and LCG as OOs. KIHMM as OES, TXI as EC. Appointments renewed: KIBEN, FHP, FPF, ZTQ as ECs; KIAQB, KIBML, GIX as OPSs; BDI, FOM, FVY, MWB as OESs; AMJ, DHP, GIX, MWB as OOs; BDI and TD as OESs; GIX as OBS. Reports received: OES from KICKZ, FOM, KIAOX, FVY, LGE, YOL; OO from KICKZ, CDM, GIX, VW, QPD, Traffic: WIEFW 368, QYQ 363, AW 317, YBH 293, TYQ 107, KIJAD 175, WIQJM 144, ROX 142, NJM 112, OBR 107, MWB 81, FHP 77, RFJ 56, BDI 44, FYF 38, KIAQE 36, WICUH 28, KIACC 25, WIKLK 23, KICAK 12, WHJG 12, YBI 12, KIDHU 10, WIEJH 10, KIBFJ 6, WIFPF 6, GIX 6, BFS 5, KIBMM 4, WIRGB 4, KIBML 2, DDY2, WIJZA 2, YOL 2.

MAINE—Acting SCM, Charles F. Lander, WIQJA—SEC: QJA, PAM: VYA, VHF, PAM: JMN, RM: EFR, Traffic nets: The Sea Gull Net meets on 3940 ke. Mon.-Sat. at 1700; The Pine Tree Net on 3596 ke. Mon.-Sat. at 0800. Among those in Florida for the winter as KIGPP and FBJ with PTL and his XYL. Also down there are WABU, K4BL, KIALQ/4, WIFNT/k and WILNI, who all call into the "Southern Exposure" of the Barnyard Net regularly. UDD is now Radio Officer for the Portland Area. Mobiles from the Portland Area stood by for emergency use in the hunt for the lost plane in New Hampshire but were not required in the search. KIJWT is a new ham in Livermore. Three lusty cheers for Mary, KIADY, who received the c.w. certificate as high scorer for New England in the YLAP Contest. KIBAZ is on with a DX-40 when he can get it away from his dad, KIBAY. LHA has had his share of snow and plans to bask in Tampa's tropical wx. EWM now is calling into the PTN. KIEBG is vacationing in Florida. KIBLL is located in the high school lab in the motion picture "Peyton Place." BX, of "underground antenna" fame, has a new one—he is going to work WAM with his v.f.o. The Nasson College Radio Club has purchased a DX-40 kit. Keep tuned, fellows, and we will have some news on coming hamfests next month. Send in news on the coming events, fellows. Traffic: WIGPY 212, CEV 108, QJA 98, UDD 81, HYD 48, EFR 40, KIGAV 20, BZD 17, BYE 16, WIISO 12, KIDLP 11, WIOTQ 11, KIJWT 10, WIBX 7, EWM 3.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, Jr., W1ALP—New appointments: OFK as OPS, KIDIO as OES, Endorsements: IPZ, Shirley, HRY, Wellesley, BCN Sector 2-C, PSG Gloucester, PPT Ipswich, COL Cambridge, QQL Lynn as ECs; BCN as OBS, MX as OPS; MX and AUQ as ORS; LGO and THO as OOs; THO as PAM for 6 meters. DDF is on 40-meter phone. INZ has a DX-100 and an SX-71. Heard on 75 meters: AEB, 3WIW/1, KICSO, QGG, KWW, KIBZE, DOJ and JBV. Heard on 2 meters: BIR, UVC, SIV, LW, KLG, COX, ZMJ (has 6N2), KNJNL, GTX, KIHGW and ADU. LMZ worked 3BYF, his first Aurora QSO on 2 meters. KIGYM has a new Telrex eight-element beam for 2 meters. KIGPH moved to Burlington. BIO had an operation and is coming along fine. ASI is not on the air very much. KIDIO will have a rig on 220 Mc. soon. AWA and KIDGI are home after a trip to W6-Land. IPZ is on 6, 10 and 75 meters. NF worked VK8PT and VPSDN. KIGRP writes about a Cape Cod Novice Net on 8707 ke. Sat. at 1400. The Braintree Club held a meeting and MPT and JOB gave talks. KIBVB has a Ranger and a Gonset III. KNJLN has a Globe Scout 680-A and an HWR9-A. PSG has a new rig for 2 meters. KICHH was in the hospital. QXX has a Pan-adaptor. CLS, POS and IWK are using s.s.s.c. on 6 meters. QRM spoiled a QSO for KIEGP with K6EGP on 6 meters. KIEDV is working on WAS. SBP spoke at the Framingham Club. ATQ is working overtime. WAJ and K2RIB visited ARRL. KIBCL, the Swampscott High School Club, is active on many bands. UNA is the instructor. The North Shore Radio Assn. held an

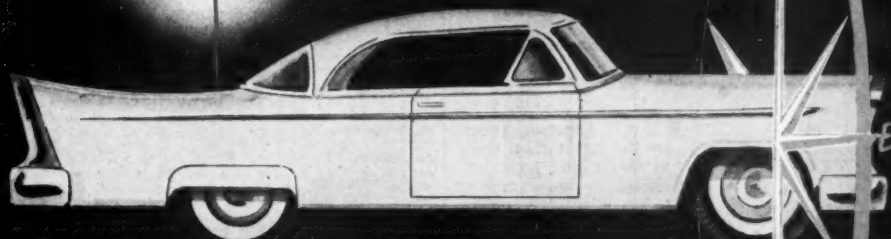
(Continued on page 144)

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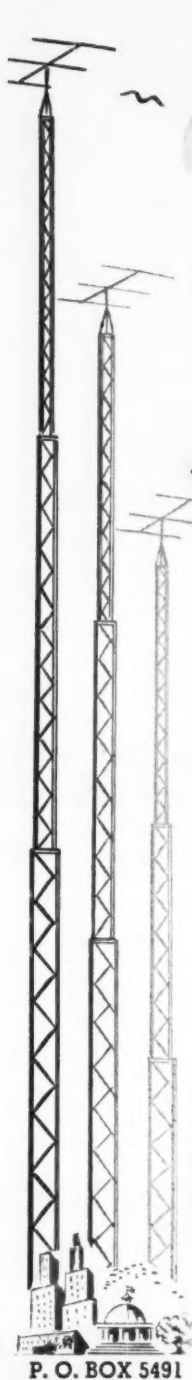
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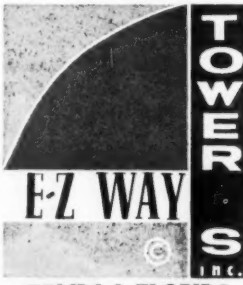
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auction. MFZ spoke at the QRA. The Federation of Eastern Mass. Clubs is going ahead with a hamfest to be held May 17 at the New Ocean House in Swampscott. The South Shore Club had an auction. The Arlington Club is working with police in a "School Patrol!" EZZ is Asst. EC for Beverly. The T-9 Club met at Harold Baker's QTH. COL is working with the Red Cross setting up a communications system. KBN applied for OBS and OES appointments. OFK has had 200 new contacts on 2 meters since May. KNIGVR moved to California. VUE is back on Beacon Hill, also WDD bought a house up there. New Novices in East Boston: JNL and JTF. The Cape Cod & Islands ARA has a certificate now for working one or more in each of the 3 counties, by working 100 members. FSG is on 6 meters. New calls on 6 meters: HVU, INH, JEL, KZD, NBN/1, YVT, DWF, EHL, EHF, EPA, ETL, LHV, LZF, NJH, OOO, SQW, Kis ASH, BHI, CRV, DCJ, DTF, EAQ, GBK, GVO, HMV, HN2 HOA, JNS, BCI, BJH, BKN, BOW, BXR, CNQ, CQX, DOJ, DVJ, GDE, GGN, HGF, HSV, HIM, IKX, IMW, IZM and JPH. IHL has a new Apache transmitter. DBY Chelmsford and HKG Malden were endorsed as ECs. NJL is moving to Waban. DEL writes from aboard the U.S.S. Cambria. DFS has appointed NTK as Asst. PAM for 75 meters. These Counties make up this section: Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth and Suffolk. All others are in the Western Massachusetts section. Traffic: (Feb.) KIBYL 504, WINJL 422, EMG 344, EUT 285, AWA 252, KIGRP 242, CMS 206, DIO 175, WIEAE 175, QPU 171, UKO 167, OFK 94, KIGYM 93, WIUIR 85, KIADH 81, WIHGN 74, LMZ 61, HGO 52, ZSS 42, TY 39, QFO 26, KIGPH 14, WIQOI 13, KYC 12, AKN 11, KIHVS 10, WISIV 10, ATX 8, WU 8, ALP 7, KIJML 6, CEH 4, WIGEK 4, KIIZS 4, WITQQ 4, LGO 3, KIUSA 3, WIAHP 2, KIBUF 2, WIDTB 2, IBE 1. (Jan.) KIGYC 33, WILGO 23, KIHVS 10, GPH 5.

WESTERN MASSACHUSETTS—SCM, John F. Lindholm, WIDGL—Asst. SCM, Richard J. Kalagher, IKGJ, SEC: BYH, RM: BVR, PAM: MNG. The West Mass. C. W. Net meets on 3560 kc. at 1900 EST Mon. through Sat. The Mass. Phone Net meets about on 3870 kc. at 1800 EST. The West Mass. Novice and Slow Speed Net meets Tue., Thurs and Sat. on 3744 kc. at 1930 EST. Congratulations to the Podunk Amateur Radio Club on being accepted as an ARRL Affiliated Club. MUCN has been endorsed as OQ, Class 1. The SEC, BYH, requests that all ECs and RO report all ARRC/RACES activity in their area to him. KIBOX is building a frequency standard and a kilowatt power supply. AJX still has a 2E26 transmitter on the drawing board but is listening with a new 6-meter converter. BVR sports a new HQ-170 receiver and reports the development of many FB operators on the WMXN. All West Mass. Novices are invited to report in. In listing above, QKC has a new Viking Kilowatt. KGI has earned an EAN certificate. OT RB has been heard on 20-meter s.s.b. with a new Collins 32S-1. What about the activity of other OTs in the section? TAY has been active with a RACES Net in the Amherst Area. The Montachusett Amateur Radio Club of Fitchburg plans a hidden transmitter hunt this spring. The Mass. Phone Net will miss JSH/1, who has left the section. HNE has a new HQ-160. No less than 44 stations participated in the January V.H.F. Contest from the Springfield Area. Anyone interested in an OES appointment? Traffic: (Feb.) WIBVR 218, KICAU 138, WIKGJ 80, DGL 56, KICSW 28, WITAY 24, DZV 23, AGM 22, AJX 21, DXS 21, DVW 12, BYH 5, ZPB 3. (Jan.) WIDZV 109, BYH 18.

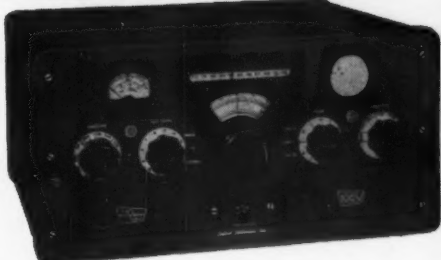
NEW HAMPSHIRE—SCM, Robert H. Wright, WIRMH—SEC: BXT, RMS: COC and KIBCS, PAM: HQ, V.H.F. PAM: TA. The GSPN meets at 1900 Mon. through Fri. and at 0900 Sun. on 3842 kc. The NHN meets nightly at 1845 on 3685 kc. The Northeast V.H.F. Net convenes nightly at 1930 on 145.8 Mc. The NH RACES Net meets Sun. at 1300 on 3993 kc. With the deepest regret I report the passing of KIBKE, of Heniker. The GSPN certificate award is now available. For details check into GSPN or contact the net manager, YHF. Several New Hampshire amateurs supplied communications during the search for the missing aircraft containing two doctors in northern N. H. The Manchester Radio Club held a 20th Anniversary Banquet on Feb. 7 with 75 in attendance. PFA reports that the combined Salem, N. H., and Methuen, Mass. C.D. Net meets Mon. at 2000 EST on 51.240 Mc. with PFA as net control. Fourteen stations are now in the net and anyone is welcome to check in. KIBCS relayed the news of a fatal automobile accident in front of his QTH via ham radio to AIJ, who in turn notified State Police by phone when KIBCS was unable to contact the local P.D. HKA has cards for WAC and has worked Wyoming, completing WAS. Traffic: (Feb.) KIBCS 1993, CIF 863, ROE 69, WYIHF 30, MOI 27, HQ 24, AIJ 10, KICSJ 10, WIDKD 4. (Jan.) WICUE 8, HQ 3.

(Continued on page 146)

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**THE REVOLUTIONARY NEW
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ONE TUNING CONTROL,
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STABILITY: The new patented two tube permeability tuned VFO circuit is exceedingly stable and is immune to the effects of line voltage fluctuations and tube ageing. Built like a battle ship, it is tuned by a husky precision lead screw assembly running in ball bearings. This is a VFO to end all VFO's.

FREQUENCY COVERAGE: 80 METERS — 3.5 to 4.5 Mc. 40 METERS — 6.5 to 7.5 Mc. 20 METERS — 13.5 to 14.5 Mc. 15 METERS — 20.5 to 21.5 Mc. 10 METERS — 27 to 29.7 Mc. A spare X position provides for the installation of broad-band coils for 160 meters, MARS, etc. OR any 1 Mc. portion of the spectrum between 1.5 Mc. and 25.5 Mc. OR any 2 Mc. portion of the spectrum between 25.5 Mc. and 29.7 Mc. YOU DON'T SETTLE FOR HALF A LOAF OF FREQUENCY COVERAGE WHEN YOU HAVE A 100V!

THE TUNING DIAL: Band scales in the large slide rule window change with the band switch and are calibrated at each 100 KC point. Frequency is read directly in 1 KC increments by the circular KC dial without any computation whatever. Approx. 12 feet of bandspread on each band. A smooth running two-speed tuning knob allows fast tuning at 100 KC per turn and slow tuning at 750 CYCLES per turn. Calibration accuracy is 250 cycles between any two 50 KC points.

METERING: Reads POWER INPUT (0-200 watts) RF AMPS OUTPUT, AC LINE VOLTAGE and CARRIER SUPPRESSION IN DB DOWN TO 70 DB.

MONITORING: A 2" scope provides an instantaneous visual check on non-linearity resulting from improper loading. Also indicates proper setting of carrier injection for 100% AM modulation. Scope presents trapezoid pattern.

OTHER INDICATORS: Below the meter a neon indicator provides a check on the operation of the NEW AUDIO LIMITER CIRCUIT. Below the scope a second neon indicator starts operating if you have the antenna or load mis-matched.

NEW AUDIO FILTER-LIMITER: The new filter is composed entirely of R-C components, yet has the steep side response and rejection characteristics of a four toroid tuned filter but without the usual harsh, ringing effects. Bandpass is 200 to 3700 cycles. This filter precedes the phase shift system and will maintain 50 DB SUPPRESSION OF THE UNWANTED SIDEBAND. The new audio limiter maintains audio drive to the balanced modulator WITHIN 1 DB, REGARDLESS OF HOW HARD THE MIKE IS HIT. IT'S IMPOSSIBLE TO OVERDRIVE THE 100V BALANCED MODULATOR! Inverse feedback circuits allow 10 DB OF CLIPPING with negligible distortion.

NEW PS-2 AUDIO PHASE SHIFT NETWORK: A twelve cross-over point network is composed of heat-cycled components having .1% accuracy. Even changing the balanced modulator tubes has no effect on its maintaining 50 DB OR BETTER suppression!

POWER OUTPUT: The husky, ultra-linear type 6550 tubes in the final of the 100V will deliver 100 WATTS OF SINGLE TONE POWER, EVEN ON TEN METERS! AND WITHOUT GRID CURRENT FLOW. Two tone third order distortion products are down in excess of 40 DB. A new POWER OUTPUT CONTROL eliminates the need for power dividers when driving A1 or A2 linears, since power output is continuously variable from 10 watts to full output.

SET AND FORGET CONTROLS: These seldom used controls are all located behind the flip down magnetic doors on the front.

GENERAL CIRCUITRY: Crystal controlled master SSB generation is at 8 MC. VFO injection is 5 to 6 MC. Crystal controlled heterodyne oscillators operate into mixer stages for various bands. This system, originally developed by C. E. is today the standard of the industry. Blocked grid keying of mixers and final amplifier provides perfect CW and PHONE BREAK-IN.

PHYSICAL DATA: Panel is standard 19" width by 8 3/4" high. Finish is smooth grey. Attractive heavy duty rounded corner cabinet is 15" deep, is finished in grey wrinkle and has a latch type access lid. Shipping weight approx. 90 lbs.

MULTIPHASE 100V complete..... Amateur net.....\$595.00
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A NEW COMPANION RECEIVER: Which will TRANSCIVE THE 100V or separate the two VFO's at the flip of a switch. The 100V has the interlock control sockets built in.

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.005% Tolerance.....\$2.50 ea.
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9001 KC to 11,000 KC:

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Specify holder wanted

ANY AMATEUR, NOVICE, TECHNICIAN BAND CRYSTALS

.01% Tolerance...\$1.50 ea.—80 meters (3701–3749 KC), 40 meters (7152–7198 KC), 15 meters (7034–7082 KC), 6 meters (8335–8650 KC) (within 1 KC).

FUNDAMENTAL FREQ. SEALED CRYSTALS

- In HC6/U holders
- From 1400 KC to 4000 KC, .005% Tolerance, **\$4.95 ea.**
- From 4000 KC to 15,000 KC any frequency;
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SEALED OVERTONE CRYSTALS

- Supplied in metal HC6/U holders
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RADIO CONTROL CRYSTALS in HC6/U HOLDERS

- In stock for immediate delivery (frequencies listed in megacycles)
- sealed crystals 26.995, 27.045, 27.095, 27.145, 27.195, 27.255, 27.305
- .005% (9/16" pin spacing) specify pin diameter .093 or .050 **\$2.95 ea.**

NEW CITIZEN BAND CLASS D CRYSTALS \$2.95 ea.

- In HC6/U holders $\frac{1}{2}$ " Pin spacing..... .050 Pin Dia.; Tolerance .005%
- Following frequencies in stock (frequencies listed in megacycles)
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- 27.075, 27.085, 27.105, 27.115, 27.125, 27.135, 27.155, 27.165, 27.175,
- 27.185, 27.205, 27.215, 27.225

FT-241 Lattice Crystals in all frequencies from 370 KC to 540 KC (all except 455 KC and 500 KC).....**\$0.60 ea.**

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Matched pairs * 15 cycles **\$2.50** per pair
200 KC Crystals, **\$2.00 ea.**; 455 KC Crystals, **\$1.50 ea.**; 500 KC Crystals, **\$1.50 ea.**; 100 KC Frequency Standard Crystals in HC6/U holders **\$4.50 ea.**; Socket for FT-243 crystal **15¢ ea.**; Dual socket for FT-243 crystals, **15¢ ea.**; Sockets for MC-7 and FT-171 crystals **25¢ ea.**; Ceramic socket for HC6/U crystals **15¢ ea.**

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RHODE ISLAND—SCM, Mrs. June R. Burkett, W1VXC—SEC: PAZ, PAMS; KCS and YRC. RM: BBN. New appointments this month include OMC as EC of Seituette, VBR as EC of Foster, K1HIT as EC of West Warwick; OMC and VBR as new OPSs. A Section Net certificate has been awarded to SMU. PAZ has been endorsed as SEC. LSP has received his 49th card for WAS. TXL has installed an oscilloscope for monitoring. K1DUY is a new member of the RIN. TGD had perfect attendance in the RIN for February. SMU earned BPL in February. The CRA was represented at the Brotherhood Dinner by POP and K1ABR. Officers of the Lincoln Amateur Radio Association are K1DWY, pres.; K1GFW, vice-pres.; K1DWH secy.; K1NGGO, treas.; and VZP, K1LJOX, K1NGOV and K1DPR, board of trustees. K1DWH has his General Class license. Several members of the EPARA completed the Red Cross First Aid Course in March. The EPARA was recently approved for affiliation with ARRL Traffic: (Feb.) W1SMU 569, BBN 76, VBR 61, LSP 28, TXL 16, YRC 13. (Jan.) W1YRC 75, LQJ 33, OMC 27, QR 16.

VERMONT—SCM, Harry A. Preston, Jr., W1VSA—SEC: EIB. RM: K1BGC, PAM: ZVZ. Asst. PAM: K1GLO. Traffic nets: VTPN, Sun. 0900 on 3855 kc.; GMN, Mon.-Sat. 1700 on 3855 kc.; VTN, Mon.-Sat. 1830 on 3520 kc.; VEPN, Sun. eve at 1700 on 3855 kc. New appointments: K1AUE as OES; HFS as EC; K1CEG and K1GBF as OPSs; FPS as ORS. All copies of the excellent *Green Mtn. Signal* were sent out through the efforts of EIB. WKJG rebuilt three RME L90s for a special project. EIB will install quad antennas for 20, 15 and 10 meters. K1CEG's mobile is back in business on 10 meters. K1BQB and AD spent many hours at their equipment supplying valuable communication during the search for two doctors in N. H. EXZ completed the 220-Mc. crystal-control converter and also worked HCIFC on 6 meters. To meet the FCC requirement of c.w. operation, check in to the R.N.W. Net on 3520 kc. Mon.-Sat. at 1830. Two-meter "club savers" are appearing in Middlebury and soon will in Burlington. K2SFF/1, of Pantano, is on with an excellent 2-meter signal from Addison County. New amateurs: K1NJP Burlington. K1CPC Winoski. K1GKL Essex Jct. K1NJP, K1CPC and W1OJU are brothers. Club meetings: BARC Inc., the last Sat. of each month. Middlebury Mike and Key, the 1st Fri. of each month. Tri-County, the 1st Mon. of each month. Traffic: (Feb.) W1OAK 297, K1BQB 35, W1HRG 29, FFS 24, EIB 22, KFG 22, ELJ 14, UWS 5, K1BOL 4, CEG 4, W1TXY 4, ZJL 1. (Jan.) W1TXY 9.

NORTHWESTERN DIVISION

ALASKA—SCM, Eugene N. Berato, K1LDZ—The PARKAS, Anchorage YL club, did it again, handling 674 messages in six days during the Annual Fur Rendezvous. K6OWQ is taking the bulk on RTTY. ALZ was relay stations. The club requests that additional stations scattered around the 48 states help out next year. DZ and BVC are en route to EA-Land. AN is pinch-hitting for the SCM. APV now is s.s.b. GJ and BVQ are sporting complete S line. PIV and BHE now are in Burbank, Calif. CDG is back in Anchorage after a long absence. IOD led the 49th state for good. BLL and AUV are vacationing in W6-Land. The C.D. net meets nightly on 145.3 Mc. All KLTs should start thinking about nominations for Alaska Ham of the Year. Send your letter to KLTAA. AYZ forgot to renew his license. CRJ passed the General Class exam. Traffic: KLTALZ 1303, CUD 674, KG1DT 585, KLTMF 4.

IDAHO—SCM, Rev. Francis A. Peterson, W7RKI—The W7/K7 QSL Bureau, Box 61, Salem, Ore., reports a lot of QSL cards for Idaho are being burnt because you haven't sent them an envelope. Also other states and countries are requesting Idaho contacts for WAS. Are there any hams in the State still working 20-meter c.w. who would send QSL cards for WAS? Get-well wishes are sent to NTQ, who just got out of the hospital. WNR finally got his home-built s.s.b. transmitter on the air. GGV gave 167 Idaho contacts during the YL/OM Party. She wants to start an Idaho YL net. The Twin Falls Club held a luncheon and a Q and A session at a meeting. The Pocatello Club is having a member give a short technical talk at each meeting. Pocatello and St. Anthony are starting some a.m. 2-meter activities. EYR has almost finished DXCC. DPD is the first to send in an EC report. Where's yours? Keep up the c.d. work.

MONTANA—SCM, Vernon L. Phillips, W7NPV/WX1—SEC: KUH. PAM: EOL. RM: KGJ. MPN meets Mon.-Wed. Fri. at 1800 MST on 3910 kc. MSS meets Tue.-Thurs.-Sat. at 1900 MST on 3530 kc. Governor Aronson signed the amateur license plate bill into law Feb. 27. The Senate vote was 45-1 and the House vote 83-4. FTD was responsible for getting the bill through. CJN was named Station Manager of the Year for North-

(Continued on page 148)



SPORTING



MOBILE

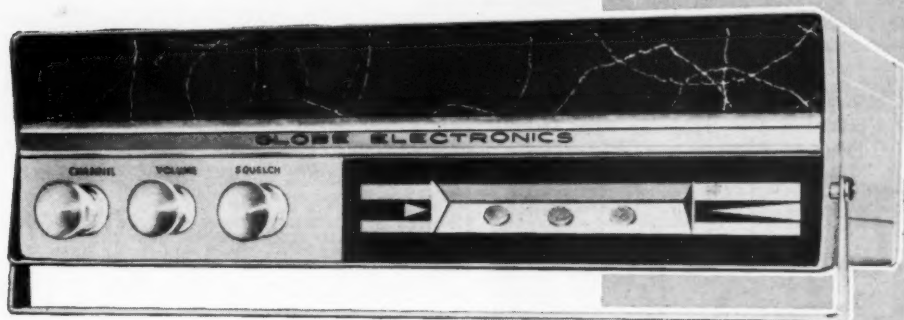
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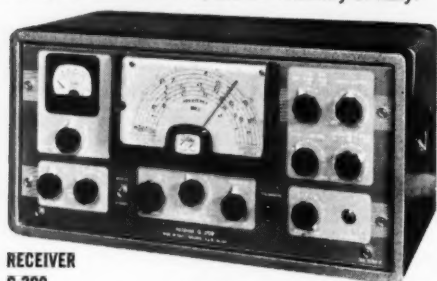
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west Airlines and won an all-expense-paid trip for two to the Hawaiian Islands. DXM is the Chief Queen Groundhog for 1960. K7BFJ was Kampus Kutie at EMCOE for February. AU is in FAA School at Oklahoma City. New officers of the Butte Radio Club are FLB, pres.; CJN, vice-pres.; K7EGO, treas.; and KN7EGE, secy. The Central Montana Hamfest will be held in Lewistown June 6 and 7. The Ham Picnic at Malta will be held June 21. The Silver Jubilee of the Glacier-Waterton International Peace Park Hamfest will be held July 18 and 19 at Apgar. Recent appointment: K7AWD as OBS. Traffic: K7EWZ 127, W7YHS 119, K7AEZ 68, BYC 35, CFA 33, DVZ 12, W7TNJ 11, DWJ 10, K7BKH 8, W7TPE 8, K7CTI 7, W7CQC 6, NPV 6, YQZ 5, DJL 4, TGM 4, MIQ 3, OIP 3, DKF 2, YUB 2.

OREGON—SCM, Hubert R. McNally, W7JDX—The XYL of RCL passed the General Class exam and is now K7BIL. DEM and K7CNZ are busy ragchewing these days. DIC has been going Portland lately and we all hope the doctor will get Bessie back to normal soon. Old sign painter MW is trying to get on 2 meters without interference. EZH has a nice outfit and has been doing some 10-meter DX. EPA is busy on 6 meters but is working on gear for 420 Mc. also. The OSN had another good month in February with new stations checking in. AJN, as RM, still is on the lookout for some c.w. operators to fill out the net. AZZ, ZB and BDU made BPL. Nice reporting letters were received from YSL and EZH. Wish more of the gang would send letters to the SCM telling about themselves and their stations. The Columbia River V.H.F. Society now is incorporated. Activity is on 6 meters with several nets and the club handles traffic for the local Sea Scouts. According to GLZ the membership is about 125. A fine report from SAR tells all about the rescue traffic handled some time ago for the CAA when a plane with 3 people was lost in the Cascade Mountains. The net formed had K7AIA as NC and those on the net were TMF, UIU, BXU, SAN, TGR, UFR, FVF, FSU, EXB, SPB, BSY, PQJ, VWG, TAZ, WKP, NES, IBZ, DHW, CTQ, MW, CSO, GUE, ADW, ADX, UHN, ISO, BLN, ZKH, K7S, GLQ, ADW, DMI, HKU, AJB and ADX. Traffic: W7ZB, 642, BDU 532, ZEH 116, K6CLL 63, W7RVN 43, AJN 27, BVH 26, K7CNZ 25, W7LT 24, OMIO 24, DIC 21, K7CNZ 15, W7DEM 8, GNC 4, MW 4, RCL 3.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—The VARC, Inc., of Puyallup held its annual banquet Feb. 21, with PGY as guest speaker. New club officers are ISM, pres.; OIV, vice-pres.; IYU, secy.; PA, treas.; DNU, sgt. at arms. A new General Class licensee in the Puyallup Area is K7CZA. MCU now is chief operator at K7W6GA. QJC is working portable KG-6. HZ was awarded a life membership in the VARC. OIV is the proud possessor of a new rotary. CPJ has a new Apache transmitter. The Pierce County RACES Net meets every Sun, at 2000 PST on 29.51 Mc. and averages about fifteen check-ins each session. REC is net control of WARTS each Thurs. QLH still is working on a 2-meter converter. AIB is back from a trip to Virginia and Florida. W7N7CUR is awaiting the new General Class ticket. The Bremerton Amateur Radio Club is sponsoring a new certificate for working all Washington counties. All Wenatchee mobiles use 3890 kc. and also use the same for mobile support for the county e.d. net. HCJ is busy with plans for the Annual Membership Banquet in Spokane. CWN has the new 10-meter beam up. GFM has the new tower and quad beam up. EMX is working on a new amplifier for 6 meters. K7AVH received his General Class license. KN7DFM received his Technician Class license. DPW is working on c.w. break-in. The Bremerton Hamfest will be held May 1 in Bremerton. Wash. USL and EQU are instructors of the code classes sponsored by the Spokane Radio Club each Fri. 7-9 P.M. CWC is new in the Washington section. OIV is a new OPS in Puyallup. RGL is a new OO and renewed his OBS certificate. CCB joined the ranks of Silent Keys. CAM has a new tower up and a new Trihandler is going up soon. PGY is NCS of RN7 Wed. nights, 3375 kc. QPX is coming back from the Philippines in May. PA is active again on 80-meter c.w. IST works 10-meter phone. GSP is working on a new cubical quad for 10-15-20 meters. The Washington State Net (WSN) held 20 sessions with 186 QNI for February. WAH is attending Pacific Lutheran College. The West Seattle Amateur Radio Club is holding a membership drive which will run until June 15, 1959. LCS has a new DX-100. CO received a certificate for 40 w.p.m. from MARS. All active clubs in the State who do not have an active EC are requested to appoint one and notify the SCM. The Annual Washington Amateur Radio Traffic System (WARTS) Picnic will be held in July. Keep an open date and listen for the time and date on 3970 kc. APS made BPL on delivery and originations. Traffic: W7BA 1759, PGY 717, QLH 43, DZX 428, APS 213, DPW 171, IFU

(Continued on page 150)

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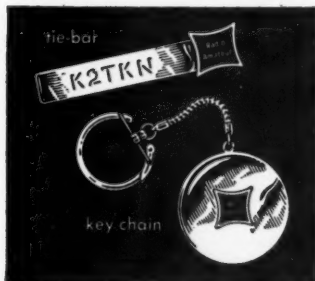
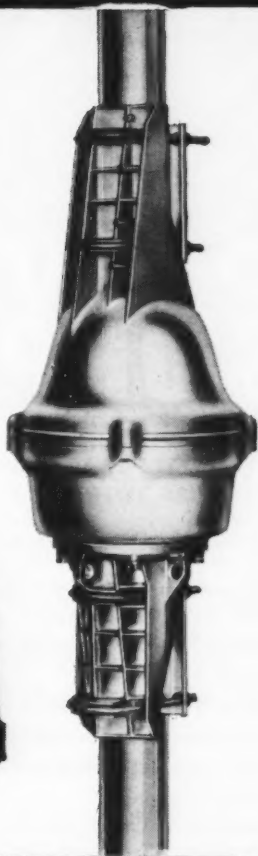
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PACIFIC DIVISION

HAWAII—SCM, Samuel H. Lewbel, KH6AED—The following was sent in by Asst. SCM, George R. Crisp, KG6AHY: KH6FAE is holding down the Air Force end of Guam and continuing its five-year sked with W6KCK4. This station is open to skeds on 10, 15 or 20 meters and is looking for RTTY skeds. W7TUX is operating KG6FAE while rebuilding his station for s.s.b. K5MSA will be on s.s.b. soon with 500 watts and a 20A exciter. KH6AHX is always ready for a ragchew on s.s.b. with 600 watts. KG6AHJ also is s.s.b. with 150 watts. KG6ACG is now KG6AFA. KH6AIH, ex-KH6CIM, is now on with a new HT-32 and triband beam. KH6CEG/KG6 is on 6 meters and has a 1200-Mc. rig under construction. KG6AE is back on after an overhaul. KG6AHF is down but should be on soon. K4KQJ/KG6 has come up with a Heath DX-100. Look toward Florida for future QSOs with him. W8JWU/KG6, one of many Guam stations active in the Pacific Net, is running 200 watts with an ART-13 on 10 and 20 meters. Club station KG6NAC is back on with a Globe King and an SX-100. Mike Qureton and Frank Laird have passed the Novice exams. Assistant SCM KG6AHY invites comments or reports from this area. Contact him via KG6FAE or mail a letter to Box 145, Agaña, Guam.

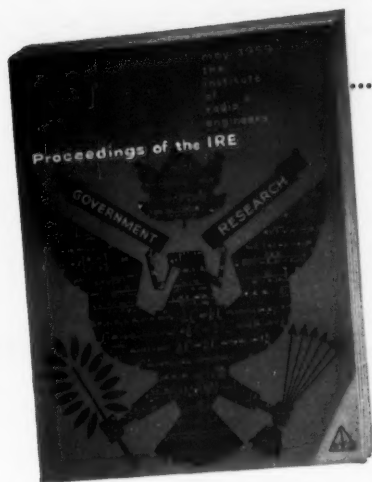
NEVADA—SCM, Charles A. Rhines, W7VIU—MAH reports 6 meters is pretty dead. The Reno Two-Meter Net has about ten members now. AZF is QRL school most of the time. VIU still is handling traffic on NVN. RN6, PAN and TCC. QYK has gone s.s.b. with a 20A. UPS broke down and got the 32S1-75S1 layout. KOI has voice control on his Viking II. IWT, BJY and lately K6EE7 are faithful check-ins on NVN at 1700 PST on Mon.-Wed.-Thurs. on 7106 kc. The net needs coverage in the Reno, Las Vegas-Boulder City, Winnemucca and Ely Areas to be really successful. How about it, some of you guys? K7AHA has gone s.s.b. with a BC-458. I can't write the news if you boys don't send me any. Traffic: W7VIU 243, IWT 9.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—Asst. SCM: Frank J. Pacier W6VMY, PAM: W6ZLO, RMs: K6EWY and W6PLG. Many clubs and groups are making plans for Field Day. K6JLU is in charge of SCARS preparations. W6DEF is planning an effective mobile lineup. The West Valley ARC was visited by W6HC and your SCM at its Mar 3 meeting. K6DYX gave a talk on the ARRL field organization. Besides Field Day plans the WVAR is busy organizing the Pacific Division Convention jointly with the SCCARA. K6MPX proxy of West Valley, promises a real bang-up affair and judging from the enthusiasm of this newly-affiliated club it will be one. Recent appointments: K6VQK as OO and OPS; W6GGQ as OPS; K6SRG as OO; W6TFH as OO; W6ASH as ORS. W6OIH complains about the scarcity of stations in the Phone CD Party. W6OWP completed a new hand-pass coupler. W6YBV is working on a 4D21 amplifier for his signal shifter. W6RSY uses a coiled Windom just 73 inches long! K6GID has the RTTY receiver completed. W6MMG reports the North Peninsula Electronics Club (NPEC) is trying to get going again. W6QIE has an "Explorer" electronics post. W6ZLO is recovering from the same kind of eye trouble that plagued Bob Hope. W6CLT will have his third WAS soon. W6BPT resigned as director of Pacific TCC. "Not mad, just tired." W6PLG is trying to plan PAN operations for the summer to please everyone. Traffic: (Feb.) K6DYX 645, K6GZ 120, K6HGV/6 119, W6QMO 102, K6GID 98, W6YBV 92, W6HC 83, W6AIT 74, W6ZLO 50, W6DEF 45, K6YKG 36, W6FON 18, W6OIH 18, W6BPT 2. (Jan.) W6OWP 4.

EAST BAY—SCM, B. W. Southwell, W6OJW—Asst. SCM: Mary E. Lorenz, W6PIR, SEC: W6CAN, ECs: W6LGW, W6ZZF, W6IUZ, K6EDN, K6JNW and K6QZG. W6AL, W6VJN, K6IGV and W6NZ attended the S.S.B. Convention in Santa Barbara. K6QHC is QRT the U. S. Navy. W6EY is alternate Radio Officer for Oakland C.D. RACES. The CCRC held its February meeting at the Richmond ARC. The EBRC heard W6FYM speak on 144-Mc. teletype at its February meeting. W6DKE is now KH6DDA and is looking for the Hayward gang on 15 meters. W6VCQP is a new member of the HARC. K6SWY is ready to roll on s.s.b. The HARC heard an FB talk on relays and their applications by Jack Pitts, W6CQK. W6ICU rejoined the MDARC after a long absence. K6VLH is building a new rig. K6RPZ is busy on phone. K6ZBL is a new OBS. W6ASJ resigned as OBS. Charles has been putting out bulletins on 2-meter RTTY regularly. W6WFR is on with an ARC-5. W6LGW is the new president of the Central California Radio Council. W6AGA is working with K6ILH at the sheriff's office.

(Continued on page 158)

IRE Salutes Government Research



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- "VFL Propagation Measurements for the Radux-Omega Navigation
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- "Submarine Communication Antenna Systems" by R. W. Turner,
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- "Some Characteristics of Persistent VHF Radio Wave Field Strengths
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- "On Models of the Atmospheric Radio Refractive Index" by B. R. Bean
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- "Image Intensifiers and Image Converters for Military and Scientific
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- "A Light-Weight and Self-Contained Airborne Navigational System"
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- "Numerical Approach to Electronic Reliability"
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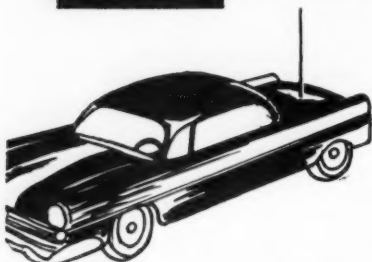
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W6IDY is celebrating 26 years in ham radio. W6CBF is policing bands as an OO. W6DJD is moving to the San Francisco section. That's all the dope for this month, gang. Your report of station activities and traffic is needed for this column. Please mail a Form 1 report card to ye SCM on the last day of each month. Remember, this is your column; I only write it. Traffic: K6GK 349, W6DMW 101, W6JOH 87.

SAN FRANCISCO—SCM, Fred H. Laubscher, W6OPL—Want to thank our Asst. SCM, Ed Olmstead, K6LCF, for the FB job he did on last month's report. It is good news for all of us to learn that the San Francisco Naval Shipyard Club and the HAMS Club are holding regular combined meetings at Red Cross Headquarters. TBF is leaving Hamilton AFB for McKinley AFB at Klamath Falls, Ore. ZUB is taking over the MARS V.H.F. Net. ZAU is on 20 meters with a new KWM-1. FFT and YME are all set up with new emergency generators. EQA is joining GQA's MARS Net to bug the net control station. Our ever faithful AI, of GQA fame, always comes through with an interesting station activity card. EKC, up Fortuna way, reports that the radio club is starting to make its plans for Field Day. SLX of Eureka, reports a new call in that city, W6DFA, and one changing the Novice call, W6BPS to W6BPS. Many happy years of hamming to you both. YOM still is in there pitching on NCN 7 and 10 p.m. on 3635 kc. Bud also tells us that the Fortuna Union High School has a new club call, K6UQI, and that the Far West RC had a visitor, KASKH. K6BAQ, "the Voice of the Tibouron Peninsula" is now the editor of QSA-5, the official publication of the Marin Amateur Radio Club. All are invited to attend the Tamalpais Amateur Radio Club the 3rd Fri. at 8 p.m. at 1066 Machin St., Novato. Recently John Reinartz gave one of his most interesting talks at the San Francisco Radio Club. We all enjoy your talks, John. We hope by the time this goes to press W6CVJ will have recovered completely from surgery. At this writing we can't give you too much information on K6UDT except that her visit from the stork might turn out to be a "double feature." Our ORS nd Asst. Dir., W6GQY, is really back in business again. Joe has been active on RN-6, PAN, TCRN and RN-7. It's always nice to hear from you, Joe. By the way, this GQY fellow turned in a traffic report of 977. Thanks a lot for all the reports, gang. See you next month. If we can be of service please drop us a line. See address page 6. QST, Traffic: (Feb.) W6GQY 977, W6YOM 116, K6BAQ 5, (Jan.) W6GQY 533.

SACRAMENTO VALLEY—SCM, Jon J. O'Brien, W6GDO, Asst. SCM: William Van de Kamp, W6CKV, SEC: W6SLE, RM: W6CMA, PAM: W6ESZ, W6JDN and W6PJV, OOs: W6WLI, K6ER, W6RFT and W6SXX, OPS: W6HSB, W6HTS, W6MWR, W6PJV, W6SXI and K6IXU, OES: W6HSB, W6OJB, W6PJV, W6QAC and K6QKB, OBSS: W6AF, W6GGW, W6HX, W6MWR, W6SBH, K6CFF, W6RFT, W6VOU and W6YBV, ORS: W6CMA, K6GL, W6ORT, W6SXA and W6YBV. Our thanks to K6CFF for a job well done as SCM. W6RR, W6GOC, W6LOE, W6LZM, W6IST, W6MST, W6YVO, W6HIW, W6WWW, W6LLO, W6SNVQ, W6QDM, W6AD, W6JEQ, K6QHG, W6AUC, W6BRG, W6OHG, W6LFZ, W6RHD, W6SBL and W6SEA operated radio gear at the 1959 Winter Olympic Trials held at Squaw Valley. W6JEQ was chairman, W6GDO, W7KME, W6OJB, W6PJV, W6QAC and K6OCY met at the QTH of W6OJB with San Francisco Area v.h.f.ers. The GEARS is saving coffee-can wind-up bands towards a coffee maker. K6GPE, W6HOL, W6PWH, W6ESZ, W6GGW are now on 2 meters. Civil defense now has a radio operating room at the Mt. Shasta Ski Lodge. Sincere condolences to W6AF, who lost his son in an auto mishap. Members of the CHIRPS YL Club sent certificates to stations worked commemorating the Sacramento Camellia Festival. W6JDN and W7LKA are now on s.s.b. W6MLN and K6HTZ are exploring 220 Mc. W6CMA is looking for CCDN operators (2000 PST M-F 3501 kc.) W6PJV took a vacation in Mexico. W6SRN is now W6CXD. W6YLQ is active on 6 and 2 meters from Chico. K6CFF has a new tower and beam. W6ZF is working on a frequency counter. W6VDQI is on 7160 kc. K6SXX hears UA# on 80 meters. W6OJB worked Mt. Shasta on 2 meters. K6YBV made BPL again. W6FKI is now mobile. W6SXI worked new ones in the Phone DX Contest. W6DBM is conducting radio classes. Traffic: K6YBV 610, W6CMA 108, K6SXX 13, W6ZF 13.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—K6TNZ got the coveted Boner Trophy sponsored by the Stockton Radio Club. W6LOS is playing around with a Model 26A teletype. W6PPO is back on 15 meters working DX like mad. W6FXV is running a pair of 811s in GG on 75-meter s.s.b. K6HTM is having grem-lin troubles with his crystal filter s.s.b. exciter. W6QOS is back on 75 meter mobile. K6LKJ is working DX on 15 meters with his "S" line. W6SJS is cleaning house.

(Continued on page 154)

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PL-177A



PL-6549



PL-175

Here are four tubes for linear amplifier service—higher power output at lower plate voltages with minimum distortion. The PL-6549 and its zero-suppressor-voltage version, the PL-177A, are for 50- to 200-watt peak output service. The PL-172, a 1000-watt type, features the exclusive Penta vane-type suppressor grid which makes possible extra efficiency and linearity. The new PL-175, a 400-watt tube, also has the vane-type suppressor grid, and gives 25 to 30 per cent more output in Class AB₁ linear amplifiers than tetrodes with similar ratings.



RATINGS

Type	FILAMENT		Max. Plate Dissipation (Watts)	USEFUL OUTPUT* CLASS AB ₁ LINEAR AMPLIFIER Plate voltage in volts				
	Voltage (Volts)	Current (Amps)		1000	1500	2000	2500	3000
PL-6549	6.0	3.3	75	96W	140W	210W	—	—
PL-177A	6.0	3.3	75	96W	140W	210W	—	—
PL-175	5.0	14.5	400	—	—	470W	605W	710W
PL-172	6.0	7.8	1000	—	—	1020W	1280W	1540W

*Actual power output delivered to load from typical amplifier.

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A friend of mine—a much brighter scholar than I am—told me that Latin phrase, "Caveat Emptor!" had its inception at a Thieves' Market which flourished in ancient Rome many years ago. "Caveat Emptor!" means simply, "May the buyer beware!"

What a wealth of shady practices that slogan brings to mind! I can almost see a fly-by-night operator, with a name like Polonius Maximus, conning a customer in fast-talking Latin. "Oh, worthy friend," says Polonius, "look at this genuine, super de luxe, guaranteed Arabian camel! Look at its teeth! By the brow of Jupiter, I swear this noble beast was last owned by a kindly old lady in Passadenium—and isn't even broken in yet!" Naturally, the noble beast dropped dead at the city gates.

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Ward J. Hinkle, Owner

K6VAZ is working as a guard at San Quentin. K6ZPZ has a kw. on 75-meter phone. K6RUQ is on 6 meters with a new rig. K6RBB and K6LNZ are editors of the Stockton Radio Club paper, *Flysheet*. W6RBM and K6AXV have designed some new gear for 6 meters. W6FBT, K6MLU, K6APE, W6OPP, K6DXU and K6SWR helped with communications for the Boy Scout Parade in Bakersfield. All amateurs in Tulare County and surrounding areas are invited to check into TCN at 1000 Sun. mornings. W6SUV is heard back on 75-meter mobile. W6NKZ started a filter s.s.b. exciter for 75 and 20 meters. The Fresno County RACES plan has been approved and K6BGO is looking for any or all to sign up in RACES. It is wise to support all c.d. nets and check into them regularly. Contact your respective Radio Officer and sign up in RACES. Remember, during a real emergency only operators who have signed up will be allowed to operate on RACES frequencies. Traffic: (Feb.) W6NQM 93, W6ADB 76, K6EJT 74, W6ARE 5, K6SWR 5, K6SNA 2. (Jan.) K6EJT 399.

ROANOKE DIVISION

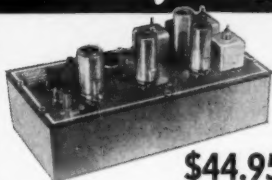
NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—SEC: HUL, PAM: DRC, V.H.F. PAM: ACY, BAW, who has devoted much time to the North Carolina Net (c.w.) on 3509.5 kc., informs me that PNM is now net manager. How about one of you fellows who meet the net accepting an appointment as Route Manager and seeing to it that we have at least one operator in the Fourth Regional Net each evening? All reports attendance is very irregular, but the following report into the NCN each evening at 7 P.M.: K4AAY, BFQ, K4BNP, AJT, K4MSM, ROB, SOT, FDV, K4EIB, PNM, BCE, BAW and K4WCZ, Ft. Jackson, S. C. I know there are many who work c.w. all the time in the State. How about you guys getting on 3509.5 kc. each evening at 7. It surely would be appreciated by the Net and Ye SCM. Two-meter activity is on the increase each month. Fellows, that is the medium we need in the AREC-RACES areas. If you don't believe it will work, just you give it a try. Everywhere it is used the operators are delighted with the results. You won't need power to work several counties. Seven watts is ample. Search the surplus market for equipment such as the 522, ARC-1 and T-23. Crystal control both the receiver and transmitter. If you are interested in longer contacts, build yourself a converter and a 50-watt transmitter. ZWF has a ham's dream for a shack. Traffic: W4GXR 530, WE 25, BAW 12.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PJE, RM: K4AVV, PAM: K4HIE. Our thanks to YOS for serving as PAM for the last year and we are sorry that he had to resign because of the pressure of duties at Clemson. The Palmetto RC elected K4DWE, secy.; and DNR, treas. K4WCZ handled 1796 messages in February. K4ANY worked long and hard in the contest and deserves to win. TWV is in the hospital and sorely missed on the S.B. Net. This net had 530 participants in February. New officers of the Rock Hill RC are VEP, pres.: HPW, vice-pres.: K4DFM, treas.: OLD, secy.: Cliff Wylie, property officer, K4HDX is net manager of the Piedmont Local Area Net on 6 meters and edits *PLAN*, an excellent bulletin. The Spartanburg "Ragchewers" Net, on 3940 kc., held 20 sessions in February. SV0WB (W4SSG) is active on 10, 15 and 20 meters and looking for South Carolina contacts. The Mar. 8 RACES meeting in Aiken was well attended and interesting, thanks to ZRH, K4AIL, regional and state c.d. officials, and the Aiken RC. The M.C. was SEC K4PJE, who also was appointed as a c.d. coordinator. Traffic: (Feb.) K4CWZ 1796, GAT 511, W4AKC 237, K4AVU 90, W4PED 87, K4BVX 79, HQK 60, PIA 53, BLF 51, W4DWA 51, CHD 48, CJD 36, K4HLK 32, IVI 22, W4KVF 20, K4LNJ 17, IIE 13, W4CZN 12, BHR 10, HDR 4. (Jan.) W4PED 48.

VIRGINIA—SCM, John Carl Morgan, W4KX—There were eight BPLers in February, including OM/YF K4QES/QER, with the former also garnering Africa for WAS on 80 meters. OOL, ATQ, UGX and K4ZJJ gave a demonstration to the high school science class. K4ASU is off on what should be his last Navy cruise before retiring. He plans to be on from 3A2 and SV0 on 14,053-ke. c.w. and 29,120-ke. phone answering calls 10 kc. lower. K4AET's son W3DAD, now ET2US, headed back for Baltimore and college. Welcome to Virginia to EEU, ex-1JZQ, and 3MGL/4, both in Norfolk. K4MJZ is settled in the new Falls Church QTH and says the entire house is devoted to ham radio. K4HFA is hunting a new QTH to cease cliff-dwelling. K4VKE reports that K8NVR joined the operator crew at PFC, the Quantico Marine Corps School's station. APM anticipates a new rig for his 21st birthday. PVA still is grinding at night school and suggests that hams passing through Staunton visit KN4BOA, Danny Dyer, at Va. School for Deaf and

(Continued on page 168)

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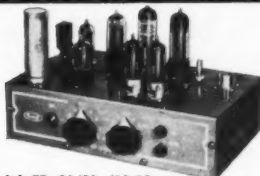


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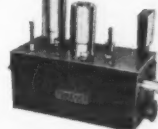
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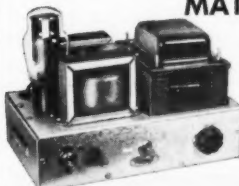
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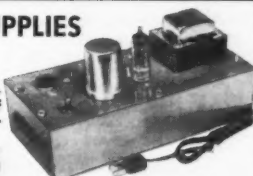


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4150 5205 5940 6420 6875 7315 7550 7710 7875 8080 8282 8375	
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4215 5327 5975 6475 6900 7315 7550 7710 7875 8080 8282 8375	
4230 5345 5995 6495 6920 7315 7550 7710 7875 8080 8282 8375	
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4630 5910 6460 6990 7380 7760 7980 8140 8300 8120 8400	
4660 5950 6500 7030 7420 7800 8020 8180 8340 8120 8400	
4690 5990 6540 7070 7460 7840 8060 8220 8380 8120 8400	
4720 6030 6580 7110 7500 7880 8100 8260 8420 8120 8400	
4750 6070 6620 7150 7540 7920 8140 8300 8460 8120 8400	
4780 6110 6660 7190 7580 7960 8180 8340 8500 8120 8400	
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4840 6190 6740 7270 7660 8030 8260 8420 8580 8120 8400	
4870 6230 6780 7310 7700 8070 8300 8460 8620 8120 8400	
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Blind. Your SCM attended the Edison Award Dinner in Washington and enjoyed old home week with a goodly number of Virginians. K4EZZ took time off from BPLing to be the only teen-ager there besides K2KGI, the award winner! JMB reports there is a second rig at K4KZGS, the club station at the Norfolk Submarine Base. K4HIA is seeking a printer for the RTTY rig. JKK reports 12 stations QNLED VN over 100 times in '58. Traffic: (Feb.) WAPFC 887, K4ELG 823, EZL 736, QES 616, KNP 577, W4QDY 402, SHJ 361, K4QIX 323, AET 191, JKK 186, W4SNH 142, K4QER 140, W4BZE 43, OOL 43, IHA 41, K4MEV 40, W3MGL/4 36, K4ASU 34, W4BGP 29, K4HIA 29, W4YVG 27, K4JRE 26, W4KX 26, ATQ 17 K4ZGS 14, W4CQX 8, AAD 6, K4HTA 4, W4JUI 2. (Jan.) W4LWF 513, SNH 141, K4MEV 60, W4PVA 11. (Dec.) W4LW 26.

WEST VIRGINIA—SCM, Albert H. Hix, W8PQQ—Asst. SCM: Festus R. Greathouse, 8PZT. SEC: HZA, PAM: GAD, V.H.F. PAM: K8IYU. RMs: GBC, FNI, PBO and VYR. Please make plans to attend the W. Va. Hamfest at Jackson Mills July 11, 12 and 13. Adequate accommodations exist for family groups and individuals to stay overnight at the Mill. We will all miss K8HRO, who is moving to Florida in June. IBF has two five-element 6-meter beams in use. K8GXR is the new Huntington V.H.F. Weather Net manager. All v.h.f. hams who are active in this section are urged to report their activities to K8IYU, the V.H.F. PAM, so that Tom can better coordinate and plan future v.h.f. activities, etc. A storm blew down the antenna of K8CRM. K8DDB has a 20-A and is building a final for s.s.b. 4VAN and SSA visited PQQ. K8BLR is very active and doing a fine job of dx operating. K4CQA/8 is busy with research work at the University but manages to do a lot of fine OO work. TWO and CSG are doing lots of OO work and took part in the recent Frequency Measurement Test. ESH has a new 2-meter Rx. On Sept. 6 there will be a picnic at Bass Lake. The first prize will be a GQ-170 receiver. Mark your calendar for this event. NYH is very active on 75 meters with traffic and ragchewing. K8GAG is a new OO. Traffic: (Feb.) K8JLF 423, W8VYR 89, K8CNB 72, W8PNI 68, PHO 53, HZA 42, K8BRM 31, W8BWK 28, SNP 27, NYH 22, K8DDB 21, HRO 8, IYU 8, CSG 7, W8BIF 2, K8BLR 1, W8TVO 1.

WEST VIRGINIA QSO PARTY

MAY 8-10

The Mountaineer Amateur Radio Association will sponsor a W. Va. QSO Party from 6:00 P.M. EST May 8 to 6:00 P.M. EST May 10. The contest is open to all West Virginia amateurs and to all others who have held calls in W. Va. in the past. Only these contacts may be counted. There are no power or band limitations and the same station may be worked on different bands for credit. C.w.to-phone QSOs are allowed but cross-band contacts are not permitted. Score 2 points for each completed contact, exchanging the following information and submitting it with your logs: date; call; time; city; county. When contacting stations outside of W. Va., obtain the ex-call of the former W. Va. station. Mobiles operating in more than one county may be worked once in each county by a fixed station, and the mobile can count the fixed station once from each county. Each contact with stations in Morgan and Hardy county will count 6 points for a complete exchange. Multiply the final score by the number of counties worked. Prizes for first and second place. To be eligible, logs must be postmarked not later than May 25 and mailed to Donald B. Morris, W8JM, MARA Secretary, Box 909, Fairmont, W. Va.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, B. Eugene Spoonemore, W0DWL—SEC: NIT, PAMs: IJR and CXW. According to the K0BWI Splatler, KN88SJ is a new ham in the area. K0BWI was home from school on a visit. K0GEU has a new operating table and the club house had a stove-pipe raising through the efforts of K0EDH, K0EDK, K0EGJ, K0EDG and UNM. K0IUI received an appointment to Annapolis. ZJO gave a club talk. K0HXC was M.C. The BARK's new officers are A. pres.; ZFJ, vice-pres.; and K0DTJ, secy-treas. K0IYE soon will have a ham TV station on the air. K0IYF is now owner of an SX-28. RRV and FQK are working DX. ANX, K0COL, YJO and K0GBS are on the auction committee of the Pikes Peak Radio Amateur Assn. K0HRS has a

(Continued on page 158)

Known World-Wide by its Audio



Globe King 500C

New filtered keying system virtually eliminates key clicks. New modified pi-net. New heavy-duty power transformer. Adjustable bias control. Improved VFO circuitry. Antenna switching relay unit. Separate power supply for modulator. Commercial type compression circuit. Optional Xtal operation. SSB input & operation; no add'l relay needed. Better V.I. protection than ever before.

Wired & Tested:
\$795.00

Completely Bandswitching, 10-160M. 540w AM & CW; 700w max. on DSB or SSB (PEP), with 15-20w external exciter.

Tops on 6 and 2M

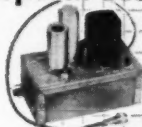


Wired & Tested:
\$149.95
In Kit Form:
\$129.95

Globe Hi-Bander

60w CW, 55w AM input on both 6 & 2M. Single control bandswitching. 4-stage RF section allowing straight through operation. Good harmonic and TVI-suppression. RF stages metered. Provisions for mobile use. 52-72 ohm coax output. New duo-band final tank circuit eliminates switching. Variable antenna loading control. Reserve power socket on rear chassis apron for accessories.

Speech Booster FCL-1



Wired & Tested:
\$84.95
In Kit Form:
\$19.95

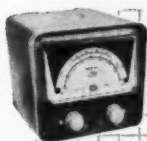
Peak limiting audio preamplifier that clips and filters speech frequencies exceeding pre-set amplitude. Increases modulation intensity for most penetrating audio. Includes harmonic suppression. Plugs directly into Scout & Hi-Bander. Adaptable to other Xmitrs.

Power Attenuator PA-1



Wired & Tested:
\$10.95

General purpose attenuator for exciters up to 70 watts input. Suitable to attenuate drive between many exciter-amplifier combinations. Standard coax input and output connectors. Tap switch to select any of three attenuation positions or straight through.



Wired & Tested:
\$59.95
In Kit Form:
\$49.95

Globe VFO 6-2

Perfect zero beat. Built-in power supply with voltage regulation. Ideal for driving 6 and 2 meter transmitters. Temperature compensated for utmost stability. Excellent for use with Hi-Bander. Approx. 50V RF output in 8-9 mc. range. 13:1 tuning ratio, king-size tuning scale. Sideband stability.



Wired & Tested:
\$29.95
In Kit Form:
\$21.95

Model 6PNC

6M Converter

New, improved circuit for higher gain, greater signal/noise ratio. Printed circuit for ease in kit assembly. Models for fixed or mobile stations or 12 volt filaments. I.F. output of 10-14 mc. on fixed, 600-1800 kc. on mobile model. Highly stable, completely shielded, crystal controlled, complete with tubes, crystal, cables. 3x3 1/2x4 1/2".

90w CW



Wired & Tested: **\$74.90**
In Kit Form: **\$59.95**

Globe Chief 90A

Completely bandswitching 10-160M. Compact (8x14x9"), well-filtered, with built-in power supply. Pi-Net matches most antennas 52-600 ohms. Modified Grid-Block keying. Provisions for VFO input & operation. Can be converted to tone with Globe Models UM-1 or SM-90 Modulators. Shielded for TVI-reduction. Kit contains all tubes, pre-punched chassis, etc.

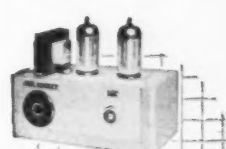
Modulates RF inputs to 100w



Kit (less tubes) **\$32.50**
In Wired Form: **\$49.95**

Universal Modulator UM-1

Class A or AB-2 modulator, driver for higher power modulator, or PA amplifier. Matches output impedances 500-20,000 ohms. Carbon or crystal mike usable. Supplies up to 45w audio with proper output tubes. Provisions for addition of external meter for monitoring modulator cathode currents; for remote control of modulator. Perforated steel cover, \$3.00 extra.



In Kit Form only: **\$11.95**

Screen Modulator SM-90

Ideal for use with Chief, but instructions for use with similar CW Xmitrs. Permits radio-telephone operation at minimum cost. Self-contained. Printed circuit board, all parts and complete instructions.

Visit Your Favorite Distributor for Details!

OTHER TOP FLIGHT GLOBE PRODUCTS

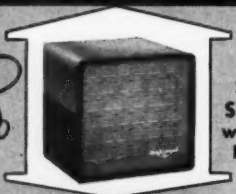
globe champ, w/t: **\$495.00**; sidebander dsb-100, w/t: **\$139.95**, kit: **\$119.95**; globe linear la-1, w/t: **\$124.50**, kit: **\$98.50**; vfo-755a, w/t: **\$59.95**, kit: **\$49.95**; vox, w/t: **\$24.95**, kit: **\$19.95**; q-10, w/t: **\$8.95**; globe matcher rf, at-4, w/t: **\$78.50**, kit: **\$68.50**; globe matcher jr, at-3, w/t: **\$15.95**, kit: **\$11.95**; globe ecot 680s, w/t: **\$119.95**, kit: **\$99.95**; power booster pb-1, w/t: **\$21.95**, kit: **\$14.95**.



LEW BONN'S *Bonnafide Bargain* OF THE MONTH

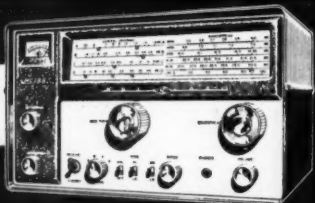
Check the Lew Bonn Co. for all your needs...
and make savings like this: FREE \$17.50 Speaker
with the purchase of these NC Receivers.

NC 109
\$199.95



FREE
\$17.50
SPEAKER
with either
Receiver

NC 188
\$159.95



NC-109 covers 540 kc to 40 mc in 4 bands. Calibrated bandspread for 10-80 meter amateur bands. Exclusive "MICROTOME" filter provides 5 degrees of super-sharp selectivity. Sensitivity: 1-2 microvolts with 10 db signal/noise ratio. Separate high frequency oscillator with temperature compensated ceramic coil forms reduces drift to .01% or less. Separate product detector for SSB makes the NC-109 America's lowest priced SSB receiver.

NC-188 covers 540 kc to 40 mc. Directly calibrated for 4 general coverage ranges and 5 bandspread ranges for 10-80 meter bands. Has RF amplifier stage, two IF stages and two audio stages. Has tone control, antenna trimmer, S-meter, separate RF and AF gain controls, automatic noise limiter. Has temperature compensated and ventilated high frequency oscillator for increased stability.

10% Down (\$19.95)

10% Down (\$15.95)

Send your order today to:

LEW BONN CO.

Distributors of Nationally-Known Amateur Equipment
Dept. Q5, 1211 LaSalle, Minneapolis 3, Minn.

beginners' code class and KAJSR an advanced class group. YAE, KJJSQ and KJST are working 6 meters. UPS lost a rotator in a recent windstorm. According to the *RF Carrier*, the WSRG is making big plans for the coming year such as hamnicks, picnics, boat races, etc. ANA soon will be on RTTY. New 6-meter calls in Denver are K0LES, MTD, CYT, K0EYJ, SSJ, K0HWO and WQG. Those operating amateur TV on 428 Mc. were K0RRC, K0JSD, K0KOK, K0MOH, K0CLJ and K0TO, with V.H.F. PAM IJR acting supervisor. Traffic: (Feb.) W8IA 1277, KQD 662, K0DCW 650, W8ANA 427, K0DXF 105, W8TVI 93, DQX 69, K0EDH 64, EDK 46, W8QOT 46, ENA 45, K0TAA 38, W8BB 34, W8CBI 21, K0EUV 19, W8NIT 17. (Jan.) W8WME 148. (Dec.) W8WME 218.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, 70CX. SEC: FSC, PAM: BBN. RM: JBV. V.H.F. PAM: SP. K7HHH has been appointed as EC for Salt Lake County, making a total of four in the section. FSC is now a net control station on the Beehive Net. BLE has quite an antenna farm. He has a 55-ft. pole with a Tribander, a 50-ft. tower with a new 40-meter beam and numerous other antennas. KN7GKE has just received his ticket. K7ELE has a new SX-99. EII is working on some microwave equipment and will enter it in the local science fair. JBV has been trying hard to make BPL but finds it is pretty tough in this area. AREC membership is steadily increasing. The Beehive Net meets each Sun. at 1230 MST on 7272 kc. Traffic: (Feb.) W7JBY 198, OCK 105, BLE 5, QWH 4, K7HHE 4, ELE 1. (Jan.) W7JBV 205.

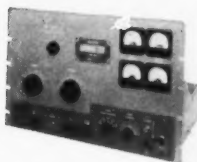
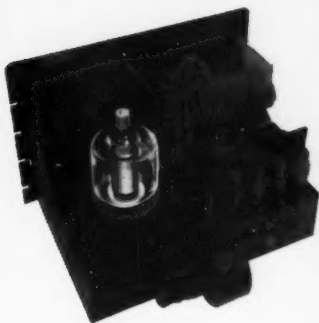
NEW MEXICO—SCM, Allan S. Hargett, K5DAA—SEC: CIN. PAM: ZU. V.H.F. PAM: FFB. Please check into the following nets as often as possible: NMEPN, Sun, 3838 kc, 0730 MST, Tue, and Thurs, 3838 kc, 1800 MST; the Breakfast Club, Mon. through Sat, 3838 kc, 0700 MST; the AREC Net, 3980 kc, at 1900 MST Tues. through Sat.; the TWN, Sun. through Sat, 1900 MST. The TWN needs New Mexico operators very badly. New OBSS are K5MSE, K5LFE, K5PHR, W8OME/3 and K5GOJ. K5LOV visited in Santa Barbara and attended an enjoyable local meeting. WNU is recuperating from an operation. Albuquerque mobiles had a drill to see how fast they could find an unmarked car just knowing the last two numbers of the license. It was found in 45 minutes. The Farmington Club is presenting a course in ham radio for anyone interested. Gallup had its Annual Sweetheart Banquet with an attendance of 45. K5RI is active on the ham bands after receiving his Conditional Class call. QSL cards are supplied by the Chamber of Commerce of Albuquerque to hams for \$1.00. K5GOJ had 9UJZ as a recent visitor. 9RUJ, Mary of the YLRL is heard on the LCL Net. Traffic: (Feb.) K5KWKSP 1638, W5DWB 677, W8OME/3 658, K5IPK 51, W5CIN 22, K5DAB 16, W5HJF 9, K5DAA 7, IQL 6, W3BQC 4, GD 4, K5HRK 4, W5WNU 4, K5LWN 3, W5VC 3, ZU 3, ESN 2. (Jan.) K5IPK 81.

WYOMING—SCM, Lial D. Branson, W7AMU—SEC: CQL. ECs appointed: Natrona County, YXM; Sublette Co., AEC; Johnson Co., BFL; Uinta Co., K7BGR; Weston Co., NMW; Sweetwater Co., PJX. Dr. L. G. VanSlyke, HX, of Basom, Wyo., joined Silent Keys Feb. 2. AHO reports he made a nice trip to Mexico with a lot of deep-sea fishing. The Wyoming Hamfest will be held west of Buffalo July 25-26. The Pony Express Net meets Sun. at 0830 MST on 3920 kc. The Wyoming Jackalope Net meets Mon. through Fri. at 1200 MST on 7255 kc. for traffic. The YO Net is a c.w. net and meets Mon., Wed. and Fri. at 1830 MST on 3610 kc. Traffic: W7DXV 62, AXG 56, BFL 34, BHH 21, CQL 6, LKQ 3, AMU 2, BKI 2, DTD 2, ION 2, YXM 2.

SOUTHEASTERN DIVISION

ALABAMA—SCM, Clarke A. Simms, Jr., W4HKH—SEC: WJX. PAMS: DGH and K4BTO. RM: RLK. It is my pleasure to announce the appointment of WJX, Adrene D. Christian, as the new SEC for Alabama. ECs, please send reports to 8436 Seventh Ave., North, Birmingham. K4VMU, the XYL of KQX, has passed the General Class exam. Welcome to a new member of AENB, K4ZXX and it's nice to have old members ZGE and WOG back again. K4PHH is very proud of the confirmation of his 75-meter phone contact with Midway Island. Welcome to a new ham in Birmingham, K4EDF. Congratulations to AEM; it's a boy. The Selma Club has been issued a charter by ARRL. Hope you are all making plans to attend the Birmingham Hamfest May 3. Mobile's Hamfest will be held May 16-17. See you there. Those sporting new gear: ZSH, a Globe King 300; K4RWV, a Heathkit Sentinel; K4TIN, a new tower and 20-meter beam; HPE, DDH, K4JSP and 1FP new homebrew rigs. Traffic: (Feb.) W4RLG 460, K4PFM 126, W4KIX 88, PVG 87, K4SSB 75, W4YRO 60, K4BTO 49, W4MI 31, CIU 29, DGH 27, KASAV 19, AOZ

(Continued on page 160)



CIRCUIT BY

CREATIVE ELECTRONICS

Economically powered by the famous AMPEREX Type 6079 tetrode, the conservatively designed "AIR MASTER" kilowatt sideband amplifier, Model H-316 by CREATIVE ELECTRONICS is outstanding for its unremitting ability to provide continuously efficient operation in the face of extremely rugged operating conditions. Complying in full with FCC requirements, the "AIR MASTER" offers complete coverage 80 through 10 meters, requires only 15 watts driving power, and provides 1 Kw average input two-tone, 1 Kw single-tone input, 1 Kw CW input, 650 watts AM linear input, and 2 Kw peak envelope power with 3rd order distortion products at 30 db minimum—all at CCS ratings.

POWER BY

Amperex®

Ruggedly designed for efficient operation as an RF power amplifier, modulator or frequency multiplier, the AMPEREX 6079 is now available at the lowest tube replacement cost in the industry. The 6079 is conservatively rated at the maximum amateur input of 1 Kw in AM, CW and SSB classes of service; typical plate voltage in all classes of service is 3000 V.D.C. and the typical plate current is 333.3 mA; plate dissipation is 500 watts. Small wonder then, that CREATIVE ELECTRONICS selected the superb AMPEREX Type 6079 to power the all important final of their equally superb "AIR MASTER". Net price to user is \$60.00. AMPEREX ELECTRONIC CORP., 230 Duffy Avenue, Hicksville, L. I., N. Y. In Canada: Rogers Electronic Tubes & Components, 116 Vanderhoof Avenue, Toronto 17, Ont.



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about tubes for communications applications

*The FCC permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of 2000 watts or more depending upon individual voice characteristics.

VHF from Hy-Gain

Easy Assembly • Easy Operation

6 METERS



15.95
2M, 5E
12.95 Forward Gain
Net wt. 9 lbs.
Boom length: 9 ft.

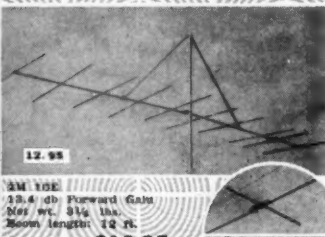
\$15.95

26.95
2M, 5E
12.95 Forward Gain
Net wt. 18 lbs.
Boom length: 18 ft.

\$26.95

New pre-calibrated (Gammastat) boom assembly with carefully formed resistance matched capacitors built in, makes possible for the first time a portable 2:1 SWR. Coax connector for 52 ohm feed included.

2 METERS



12.95
2M, 10E
13.4 db Forward Gain
Net wt. 3 1/2 lbs.
Boom length: 12 ft.

\$12.95

6.95
2M, 5E
9.40 db Forward Gain
Net wt. 3 1/2 lbs.
Boom length: 6 ft.

\$6.95

10.95
1 1/4 M
14.2 db Forward Gain
Net wt. 3 lbs.
Boom length: 12 ft.

\$10.95

9.95
3/4 M
10.1 db Forward Gain
Net wt. 1 1/2 lbs.
Boom length: 8 ft.

\$9.95

All Hy-Gain 2M beams incorporate the helical dipole matching system. Perfect 200 ohm match for K 100 low-loss parallel line or 52 ohm coax thru a half-wave balun. Manufacture included for matching 75 ohm cable, 300 & 450 ohm balanced lines. 39 and 1 1/4 M beams use helix dipole adjusted for perfect match to 50 ohm low-loss open wire lines.

VHF VERTICAL

A new accounting allows principal makes possible for VHF 2m wave services maintaining efficient operation for the 2 and 6 meter bands. Overall height: 2 1/2 ft. net weight: 24 oz. Complete with 5 band tuning ground plane and nylon base insulator assembly.

\$16.95

See the Complete Hy-Gain Line in Stock

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OWNED BY
Nick Young, WIABU, A Ham Since 1912

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13, IFF 11, KQN 11, W4HKK 10, CEF 9, K4HFX 9, K4JSP 8, PHH 7, KAK 5, KJD 2, W4ZSH 2.

EASTERN FLORIDA—SCM, John F. Porter, W4KJG; SEC, IYT, RM; K4SJH, PAMS; TAS and RMM. New officers of the Indian River Amateur Radio Club are NLX, pres.; K4IZC, vice-pres.; K4PTK, treas.; K4YUT, corr. sec.; VQY, rec. sec.; and HCG, act. chairman. The BARC picked up donations from Browardites in the United CP Fund Drive. Net control stations were DLM and K4HGY. K4EAC is the new secy. for the Suncoast V.H.F. Club. The club now has 31 members. The MSR Club is conducting code and theory classes. Second and third places were won by K4LNS and BLI in the W4FC Contest. DCV has a new 75A-4 and Collins Kw. The LW AREC provided all the communications for the LAKE Wales Annual Air Show. The DEN 6-meter section has now grown to 62 check-ins. FNR now has 44 states and 17 countries on 6 meters. 50 Mc. is picking up in the Jacksonville Area, according to RMU. Allen is running a TE test with South America, using 900 watts A1 and 500 watts A3. Hollywood has a new club. Officers are K4OYR, pres.; PVP, vice-pres.; PM, secy.-treas.; and K4JUB, club EC. New officers of the Lakeand ARS are K4RDB, pres.; LDB, vice-pres.; K4PSL, secy.; K4VQB, treas.; and K4LTX, publicity. The Hillsborough County Six Meter Net (AREC) began operations Feb. 18. The net operates on 51.45 Mc. and K4LLG is looking for new members. Collier County now has an AREC Net on 29.6 Mc. The Southwest Fla. Fair was a big success with the Ft. Myers Club handling 642 messages. TKS/4 was in operation during the whole affair. K4BLM won the Dade ARC WAS Contest. The Manatee ARC booth at the De Soto Celebration proved a big success. ZCD, SJZ and K4JG have moved into new ham shacks. The Dade ARACAS held its annual meeting and elected IYT, chairman; and K4AHW, K4ENN and JO, vice chairmen. The Red Cross has agreed to purchase new 6-and 2-meter base stations before July. K4SJH, K4QLG and FPC made BPL. K4TCM is the new New Smyrna Beach Area EC. K4LCF is a new OPS and K4BY is a new ORS. QDZ is the new Hillsborough EC. K4LDR is a new OO. After the Orlando Hamfest let's all push the Silver Springs Statewide Fest. Traffic: K4SJH 1066, W4FPC 897, TKS 642, K4RZQ 407, KDN 359, QLG 334, BNE 251, ILB 180, AX 152, BY 137, W4YIT 119, K4COO 115, BLM 99, RNS 96, W4FFF 87, K4ODS 80, W4SMK 73, K4AHW 77, LCD 58, LCF 44, W4MT 39, K4PAD 30, MBB 31, W4AHZ 27, EHW 24, K4VEJ 24, MTP 22, W4EHR 21, K4UTH 19, W4DQS 14, K4SLR 10, IWT 8, LDR 7, BZ 6, W4SJZ 4.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH; SEC, PQW, RM; AXP and BVE, Port St. Joe; K4RZM, K4RZF, MXN, K4VQQ, ALN and SGG took part in an AREC drill. BZF and MXN are mobile. LQX has been appointed c.d. director of Gulf Co. CCA is now active in Wewahatchka. Tallahassee: CHZ, BKV, YUU, K4PVU and GAA are active in the 2-meter C.D. Net. Fort Walton: The local hams sponsored a dinner meeting, with hams from Pensacola and Panama City attending, at which CXP was guest speaker. New hams in the Playground Area are SED, NIV and 3HWQ. K4HXV has a new Heath Seneca v.h.f. rig. The NWP now meets daily 1700-1800. NCs at present are K4OID, K4RZQ, K4PVU, BVE and K4UBR. Pensacola: Through the efforts of SRK, a drill message was originated by the Mayor of Pensacola to Governor Collins in Tallahassee. Total time from origination to receipt of reply was only 11 minutes. Others participating were K4SOI, K4LQC and K4PVU. NAS Radio Club officers are K4LQC, pres.; W4W, vice-pres.; K4UKG, secy.-treas.; BVV, trustee. Meetings are held the 2nd and 4th Thurs. in Bldg. 1586. New hams in town are K4EAP, KN4DSV and DSW, K4TSZ, K2ARN, 3DRG, and 8TIF. PIQ has Gosnet Twins in the new buggy. K4HYL ran his kw. up to full power and set the tri-band beam on fire! Traffic: K4UBR 586, OJD 514, W4BVE 123, SRK 121, K4PVU 58, W4GAA 8.

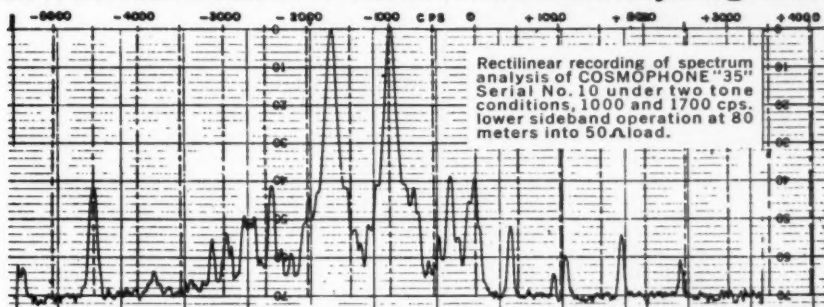
GEORGIA—SCM, William F. Kennedy, W4CFJ; SEC, PMJ, PAMS; LXE and ACH, RM; PIM, GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs. 6800 Sun.; GSN, Mon. through Sun. at 1900 EST on 3995 kc., PIM as NC; the 75-Meter Mobile Phone Net each Sun. at 1330 EST on 3995 kc., MV as NC; the Atl. Ten-Meter Phone Net each Sun. at 2200 EST on 29.6 Mc., KWC as NC; the GTAN, Sat. at 1600 EST on 7260 kc.; the GPVJ Net Thurs. at 7260 kc. at 0900 EST. K4CYV as NC; the GAN, 7105 kc. at 1800 EST Mon. through Fri., K4KZP as net mgr. We hams of Georgia were sorry to hear of the passing of Mrs. Harris, the wife of MNZ. We also are sorry to learn of the passing of the wife of TSN, ARRL's President. K4RCJ's XYL is now KN4BDZ. K4LVE is now RT-1, Box 90-D, Warner Robbins, Ga. The Atlanta Teen-Age Club is increasing with new members. K4OQY has an 813 in the

(Continued on page 162)

He Measured the Heartbeat of a COSMOPHONE "35"

A new Cosmophone "35" owner put his unit through its paces and kindly sent us the unsolicited "electro-cardiogram" shown below. We are proud to publish this inter-modulation components characteristic of its amazing, unwonted signal suppression—why Cosmophone "35" audio is clearly identifiable over any other set. We challenge you to compare the Cosmophone system by any standards over any other receiver-and-transmitter combination available today. You'll agree that there simply is no comparison!

See it at Your Dealer . . . You've Never Seen Anything Like It!



THE FIRST DUAL CHANNEL BILATERAL TRANSCEIVER

- Operates on 10, 11, 15, 20, 40 and 80 meter bands.
- Transmits or receives SSB (upper or lower), single sideband with carrier (AM) or C.W.
- Peak-Null "Q" Multiplier.
- Receiver Sensitivity. 1 Micro-volt @ 6 db S/N ratio.
- Single 6146 output.
- Built-in VOX and QT.
- 40 db suppression.
- Meter Indication for R.F. output, final Grid or Plate current and receiver signal strength.
- Dimensions 17" wide x 12" high x 15" deep.
- 3.1 kc mechanical filter for transmission and reception.
- Dual speed tuning knobs with ratios of 20:1 and 100:1 over a 600 kc band spread.

Power Supply #P35



Immediate Delivery at Your Dealer

For additional information and dealer nearest you, write Department QST-5

Amateur Net Price **\$799⁵⁰** **\$139⁵⁰**

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31-28 QUEENS BOULEVARD, LONG ISLAND CITY, N. Y.

FOREIGN REPRESENTATIVES: Minthorne International Company, Inc., Cable Address: Minthorne, N. Y.

The New ELENCO COMMANDER

4 KW P.E.P.
Grounded Grid
LINEAR AMPLIFIER



- ▶ 6000 Volt power supply for high efficiency
- ▶ Hipersel transformers for compactness
- ▶ Easy to drive. No wasted exciter power
- ▶ High-low power switch for tuning and quick power change
- ▶ Double interlocked for absolute safety

Although designed to commercial specifications, the Elenco Commander operates with excellent efficiency at the legal amateur power limit of 1 kw average d.c. input. Working well within its rating, the amplifier gives superior performance on five amateur bands, 10 through 80 meters.

ELENCO "POWER GAINER"

Audio Compression
Amplifier

- 4 Times Power Gain,
- Prevents
Overmodulation
- AM-SSB-DSB



only \$39.50

New factory-to-consumer sales plan (direct sales only) includes trade-ins, time payments, money-back guarantee.

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final running 300 watts. K4HOU is making modifications on the DX-100. K4HOU will be on the engagement list when school is out. We are sorry to hear of the passing of K4JGP, Chattanooga, Tenn. K4KWC is doing a nice job as net control of the Atl. Ten-Meter Phone Net. K4KWC also has a new NC-303 RX. ZWT turned in an excellent Official Observer report for February. The Middle Ga. Club elected RZX, pres.; K4AT, vice-pres.; K4DNB, secy.; K4DXX, treas.; K4ARL, act. mgr. The South Georgia Ragchewers Annual Hamfest will be held at Thomasville, Ga., May 10. The Augusta, Ga., Annual Hamfest will be held May 16-17. Check your League appointments to see if they need to be renewed. Traffic: W4PIM 292, DDDY 182, K4LVE 102, BAI 78, UWJ 70, OQY 13, VHC 12, OLQ 7, HJZ 6.

WEST INDIES—SCM, William Werner, KP4DJ—SEC: AAA, KD qualified for "W-DEL" and "Gay-lark" certificates. He is up to 241 for DXCC and 92 for phone DXCC. W4PTT and XYL and K3EER and XYL visited KD. KP4IQ is now KX6CW and his XYL, KP4KQ, is KX6CM. YT has a new Valiant transmitter. AMG continues as NCS of the P.R. Amateur Emergency Net on 3925 kc. at 7 p.m. Wed. AMG installed doublets for 20 and 10 meters in addition to the present 40- and 80-meter doublets and is building a p.p. 813 final. CK replaced the 10-15 cubical quad with a 10-15-20 cubical quad. AIS is a new station on 3925 kc. with a new NC-303. APY is working Pacific DX on 20 meters using a 32V-3 while building a p.p. 4-250A final. The PRARC Annual Hamfest and election of officers was held Mar. 15. JM, ABN, AHK, AHX and AJK are working Argentina and Chile on 50 Mc. CH is on 80-meter c.w. using low power after an eight-year absence from ham radio. W4API worked WY6s and QZTF on 15 meters and is writing an interesting Novice column for the PRARC Ground Wave. WT reports to the 3925 kc. Net Wed. the Antilles Weather Net 7 a.m. daily and the MARS Net at 6 p.m. on 40 meters. W4AQA soon will be W4AQA/3 from Pennsylvania. CA is having drive trouble in the TBS-50. HZ is replacing the steel tower with an aluminum tower so he can lower it quickly during the hurricane season. AT sticks to 40-meter c.w. MP is building an s.s.b. generator and a kw. final. W4AOD has 37 states confirmed on 15 meters from the new QTH in Rio Piedras. W4PAQK is getting out fine on 15 meters from Baldrich. DJ applied regulated voltage to plate/screens of the H.F. oscillator and mixer tubes in the HRO receiver and changed the wiring so that voltage remains on these tubes even during transmitting periods, reducing the drift on 28 Mc. to zero. Traffic: KP4WT 46.

CANAL ZONE—SCM, Ralph E. Harvey, KZ5RV—At the meeting of the Canal Zone Amateur Radio Association Mar. 5 the SCM gave a short talk on the ARRL and what it has done for the advancement of amateur radio since it was organized in 1914. The SEC explained the duties of the various appointive offices in the AREC and invited all amateurs present not already members to join the AREC. K9DMG and his XYL were the guests of UJ and his XYL, CJ. The Cross Roads Amateur Radio Club now has a new location and is moving to Coco Solo. BG has been transferred to the Gold Coast and soon will be back on the air from Coco Solo. VR took part in the recent YL-OM Contest and worked WAS, including Alaska. She hopes that she gets QSLs for confirmation for the WAS certificate. LC was heard in the recent ARRL DX Contest and Len says that he made over 700 contacts, mostly on c.w. HG has returned from a well-earned vacation in the States. Traffic: KZ5JJ 93, OB 89, HQ 52, RJ 41, RR 40, WF 37, VR 36, UR 15, JN 11, LC 11, RM 7, RV 7, DH 6, BS 2, RD 1.

SOUTHEASTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, Jr., W6JQB—SEC: W6LIP. RMs: W6BHG and K6HLR. PAMs: K6BWD and W6ORS. The following stations made BPL in February: K6HLR, K6LVR, W6GYH, W6CG and K6OWQ. K6GKX reports that the Intra-County Net is sponsoring a V.H.F. QSO Party on 220 Mc. For details, contact K6HLR. K6GOK and W6GYM report several good 6-meter openings. The Westchester Amateur Radio Association's new officers are W6KIZ, pres.; K6KED, vice-pres.; K6RAD, secy. K6OQD is sporting a new Panoramic receiver. W6LSY enjoyed a nice trip to Death Valley. W6BES is keeping a sked with W4DTL. W6AKY is celebrating his 83rd birthday. Congrats. "Uncle Fred" W6SRE is sporting a new NC-303. K6COP and K6PLW report some fine DX on 20 and 10 meters. New officers of the Associated Radio Amateurs of Long Beach are W6KQI, pres.; K6KXQ, vice-pres.; W6IMT, secy.; and K6KNP, treas. K6TPL is working some fine DX on 40 meters. W6AM now has 292 countries confirmed. K6GVH is on 10 and 2 meters with Commu-

(Continued on page 164)

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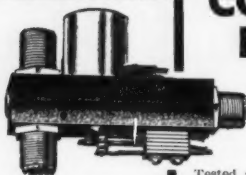
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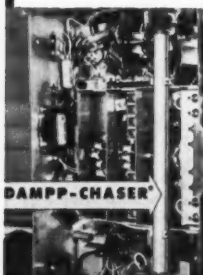
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pres.; LLK, vice-pres.; LR, secy.-treas.; ZYA, program dir.; HCS, tech. dir. K5AEX spoke on civil defense at the club's Mar. 3 meeting. K5MJC is the proud owner of a new 101 receiver. The Tarrant County 6-Meter Emergency Net held a practice evacuation drill Feb. 28. All the personnel and cars at the U.S. Public Health Service Hospital were moved to a rendezvous area. Mobiles were stationed along the route and kept hospital officials informed of the progress of the convoy. The efficiency with which the operation was carried out drew high praise from the hospital staff. This net has a trailer completely equipped with radio for all-hand operation and room for two to sleep. GY reports some progress is being made in the formation of a c.d. unit in Naples. LR wants to hear from old-timers interested in joining the Quarter Century Wireless Association. Traffic: W8MK 384, BKH 206, W5GY 182, K5IDZ 83, JSN 88, W3BOO 82, K5PNV 65, W5BTH 64, K5HGL 54, ILL 43, W3OCV 40, LR 30, K5JUN 27, W5PTL 18, K5KHH 14, IBB 13, ACD 12, W5RVT 2.

OKLAHOMA—SCM, Richard L. Hawkins, W5FEC—SEC: K5KFS, RMS; JXM and K5JGZ. PAMS: DRZ, MFX and VCJ. The Lawton-Ft. Sill Hamfest was a huge success with hams from all over Oklahoma present. VCJ has been appointed as V.H.F. PAM. Contact him for all information on v.h.f. activities in the section. NMD has a new 328-1. Dried-in-the-wool c.w. man JKS has discovered a.m. and 15 meters. K5CBA, K5DUJ, UCT and K5MYF met the requirements and were issued OLZ/SSZ certificates. KN5OXF and KN5SHF are planning a Dallas trip for that General Class ticket. New EC appointees are KUC, UYQ, PHP and K5JOH. The State C.D. is trying to get RACES started on a statewide basis. PAA has a new beam up. A new ORS appointee is K5JGZ. EHC renewed his OPS appointment. PML is due back from DL4-Land. Do not forget to attend the ARRL National Convention at Galveston, Tex., June 19, 20 and 21. Please report your station activities by the 5th of each month. Oklahoma Ham of the Month: PNG for his years of faithful attendance and support of the c.w. traffic nets. Traffic: W5DXI 538, K5MBK 375, USA 350, W5DRZ 341, K5JGZ 130, W5KTC 163, UYQ 47, MGR 43, K5JTW 33, W5CCK 28, EFC 28, K5OCZ 28, INC 27, W5MEX 22, K5CBA 16, W5WAF 15, PNG 14, YZB 11, UCT 9, ESB 8, K5EZM 8, K5F8 8, W5HIM 7, K5BAT 4, ELG 4.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: K5F, PAM: ZIN, RM: K5BSZ, EGD the new president of the Gaylarks. New officers of the Corpus Christi Radio Club are QEM, pres.; APT, vice-pres.; GPV, secy.; K5KRZ, trans.; HJM, act. mgr.; K5ONX, pub. mgr. In addition to the officers the following directors were elected: AQK and SIL for two-year terms, CRO and KN5TFO for one year. The 7290 Traffic Net had 39 sessions, 465 messages and 1303 station check-ins. LOW and PMT are moving to Oklahoma City, K5EVL to College Station, Tex., and CRO to Pensacola, Fla. South Texas certainly will miss these work horses, but our loss is some other section's gain. K5MMY is anxiously awaiting the nice piece of paper that will allow him to drop the "N" from his call. K5HYS is punching a hole in the ether with a new vertical. Congratulations to K5RYS and K5OEA on making BPL, RYS for the first time and OEA for the third. Chuck, the BPL Medallion will be nice to hang over your bunk in the Submarine. Welcome to #1LV out El Paso way. Also welcome back to DE, AQK for the new EC for Corpus Christi and Nueces County. K5GTO and K5RYS are new OOs covering West Texas. Traffic: (Feb.) K5-FGF 972, OEA 509, RYS 196, W5EGD 105, LVC 90, ZIN 64, K5MWH 30, W5QLT 28, K5KBD 9. (Jan.) K5RYS 103.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCM's: A. D. Solomon, VE1OC, and H. C. Hillyard, VOICZ. SEC: IBL, XY and AAZ have been maintaining daily schedules on 10 meters with VE3EGD/SU in the Gaza Strip while ADU has been working him on 20 meters and handling traffic for the Saint John Area. Newly-elected officers of the Keith Rogers Memorial Club are BZ, hon. pres.; ADR, pres.; BF, vice-pres.; ZM, secy.-treas. Maritime correspondents for the new Canadian Amateur magazine are RJ (Nova Scotia) and VE (Prince Edward Island). The Newfoundland AREC was active during a severe storm in February. Those participating included VO1s AO, FB, BU, BJ, AK, FD, BY, D, AI, BD, DT, DP, ER, EZ, CG, DG, I, CG/I, AB, CZ, K5JQO/VO1, W2RRX/VO, K0HBB/VO, VE1-WL, CZ and OM are trying out new beams. LZ has a new KWM-1 installed in his car. About 150 Nova Scotia amateurs are sporting their call letter license plates. DX stations, working for their WAVE or WA CAN certificates on 10 meters, are complaining that the province of New Brunswick is rare DX to them! Don't

(Continued on page 183)

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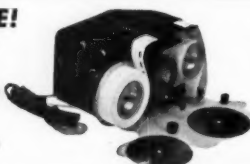
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NEW JERSEY

forget the Convention, Labor Day week end, at Halifax, Traffic: (Feb.) VE1VN 84, ABJ 64, OM 17, ADH 13, ES

ONTARIO—SCM, Richard W. Roberts, VE3NG—Latest news has it that Ontario Hams are forming an organization known as the Ontario Amateur Radio Assn. BIF is promoting the 11 Meter Net. This is a coast-to-coast net. CAB broke his ankle. NZ was snowbound. OQN is looking for new recruits. RW is a new OBS on 75 meters. KM is in W4-Land mobile. UY also is in W4-Land mobile. PN has a 600-watt PA. NM is back after a lengthy absence. PY has a new beam. CDX is s.s.b. BXJ runs the Windsor round table Sun. on 3757 kc. at 1400. A new EC in Kingston is EJJ. The Westside RC held its Annual Dinner Apr. 4. The Nortown ARC held its Annual Dinner in March and a very successful one it was. DWN is tech. editor for the new *Canadian Amateur Magazine*. Your SCM and SEC paid a visit to the London ARC and a better meeting would be hard to find. The boys in the Windsor Area decided to forgo the holding of the ARRL Convention for at least a year but latest word is that London will take it for 1959. VD reports that he is working DX with the antenna in his shack. BJR had loads of traffic from the Tampa, Fla., Fair. TM is rebuilding. CFI is working on WAC with the addition of his new NC-300. ASA is vacationing in Bermuda. DTB has a new transmitter. RH has a new receiver. ELC visited in VE2-Land. HE has a new Harvey Wells receiver. Bruce West, of Toronto newspaper fame, has been bitten by the ham bug and expects to get his ticket soon via the Nortown classes. BVF really was snowbound this winter with five feet of snow. MF has a new Mohawk receiver. Prince Edward Island VEIs are active on 20-meter phone. WAVE applicants, please note. Traffic: VE3BUR 349, NG 104, BZB 90, AUS 87, DPO 81, EII 75, NO 70, AUU 63, TM 60, CFR 44, BJV 41, AML 40, EIH 26, DMI 23, DUX 21, DH 18, DWW 17, CLF 15, ADN 14, BXJ 14, CDX 11, DLC 9.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—Traffic nets: C.w.—OQN, 3535 kc. at 1900. Quebec Phone Net, 3780 kc. at 1845. With deepest regrets we learned of the passing of G.H. of Lachute. A well-known and beloved OT, he was active until the very end. The sad news of the death of the XYL of LO reached us in February. To both families our sincerest sympathy. WT is a fine c.w. operator at Joliette. AHW is passing around the cigars; occasion—a junior operator arrived. AKF moved to Abbotsford and is active with a Challenger transmitter. ADP gives code practice and expects new hams in Sherbrooke. WW and YU appear to be leading the local brigade in the ARRL DX Test. CA worked c.w. on all hands. JE is joining the mobile clan. AWK received C.W. WAC. VO1DQ will sign IN. ARB is ex-3AXS and operates from UN. BAO is successful by DXing with a quad antenna. ASW is back from W-Land, where he signed /W1-5. JI was VO2AT. The Royal Montreal Regiment ham station is BAR. IP worked 77 in Idaho on 80 meters. DZ is back on the air with n.f.m. and an HQ-129X. ACD built a rig using 813s. ASA is the station of the Air Cadet Wing. PY operates VE8NA on a Navy ship. ABE's WAC was confirmed. PG skeds on 80 meters. Club station JC was operated by AWW. AWR, ABE and ATL during the DX Test. ATL is proud of the first club bulletin of JC. ABE will operate FP8BC during July, the first Quebec DX expedition to this island. Traffic: VE2DR 78, CP 66, EC 34, ABE 14, JC/2 8, APR 7.

ALBERTA—SCM, Gordon W. Hollingshead, VE6VM—PAM: OD, TF and UK recently added s.s.b. adapters and may be heard regularly on 20 meters. SE, in Courts, reports a 2-meter mobile net is being organized for Southern Alberta and Northern Montana. MO is building a bigger voice on 2 meters with the new antenna he is constructing and hopes to work Calgary with a Viking. AM can be heard regularly on 10 meters. RF, in Grande Prairie, reports difficulty working VE7s with a dead power supply. It seems a mouse and an 866A got together during a QSO. WG can be heard daily on 40- and 15-meter c.w. The Lethbridge Club elected the following officers: IU, pres.; QV, vice-pres.; LC, trans. Traffic: VE6YE 40, OD 16, YM 7, PV 6, TG 5, SS 4, SF 2, TT 2, UK 2, BL 1, OM 1.

MANITOBA—SCM, James A. Elliott, VE4IF. Four members of the Beausejour Radio Club are taking the radio monitor course with the civil defense. The ARRL members were guests of a local 807 factory recently. Another code class has been started with 33 members. This class was organized by the ARRL and the Winnipeg School Board, with SR as instructor. Renewed activity is being shown re car license plates. There still is hope! ER still is under the doctor's guidance and is progressing slowly. QX is building s.s.b. Peg, PE, has joined the Advanced class and will be heard on 75- and 20-meter phone. VK3AMH, Bob, has been maintaining skeds with home over Blair, CP station. Con-

(Continued on page 170)

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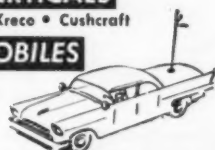
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40	6 Foot	HW-40	\$18.00 1025
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10-15-20	6-Foot	HW-3	\$25.50 1950

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TOWERS

ALL THE WAY - IT'S EZ WAY

See Page 144
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170

grats to KP, EG and QX, who passed the Advanced Class exams. XP is rebuilding. EO and LEN did nice traffic-handling jobs during the St. Louis tornado disaster. Traffic: (Feb.) VEAKN 22, GE 9, IF 8, JY 8, QD 8, AN 4, BF 4, EG 3, MW 3, MH 2, TE 2, WW 2, IW 1.

SASKATCHEWAN—SCM, Lionel O'Byrne, VE5LU —At the annual meeting of the Regina Amateur Radio Club the following officers were elected for 1959: DG, pres.; W5GTW/VE5, vice-pres.; HV, secy.; VP, treas. An excellent talk on Wave Propagation was given at the meeting by RG. JK has been appointed OBS. FA has a new Ranger. LE and JO are heard on s.s.b. 3EDK, ex-3EO, is back home on QSOing the old gang on mobile. Traffic: VESRE 8, IG 6, QL 4, KV 2, WR 2.

Monitrol

(Continued from page 19)

are available on the top end of the chassis. The 6C4 and the two relays project horizontally from the right face of the chassis. All connections are to a terminal strip on the back.

Under-chassis arrangement is not critical. The transistors and related circuitry are on a resistor mounting strip raised from the chassis on $\frac{3}{4}$ -inch separators.

It might be possible to calculate resistor values which would give desired time constants on the speed control. However, values will vary with the transistors used and with the relay adjustment. It is easier to select the resistors empirically (that's a five-dollar way of saying "cut and try"). Our method was as follows: The complete unit was assembled, and wired except for the speed-control resistor network on S_1 . Using test leads, a 5000-ohm variable resistor was connected between point A and S_{1A} in the position of R_1 . Using the monitor to listen to the signal, the key was closed with S_1 in position 4. The variable resistor was adjusted to give the length of dash desired at the maximum speed setting, removed from the circuit, measured, and a $\frac{1}{2}$ -watt fixed resistor of equal value wired in at R_1 .

The variable resistor was then clipped across the position to be occupied by R_2 , between point A and S_{1B} , and adjusted to give twice as many dots as dashes in a given time. The measured value determined R_2 .

Similar procedure determined the values of R_3 and R_4 , R_5 and R_6 , and R_7 and R_8 , moving the SPEED CONTROL down one notch for each pair. A couple of times, the measured resistance was a value we did not have on hand. When this happened, a new measurement was taken between point A and the appropriate switch contact, and the fixed resistor was installed bypassing those already in place.

Operation

The key is a Vibroplex, modified by removing the jumper which connected the dot and dash contacts under the base. It is connected to the unit with a piece of four-wire rotator cable from which one wire was stripped and shielding added. The 0.01- μ f. ceramic capacitor was required to eliminate r.f. pick up. For use with the automatic keyer, a rubber band anchors the weights to the damper mechanism on the back

(Continued on page 172)

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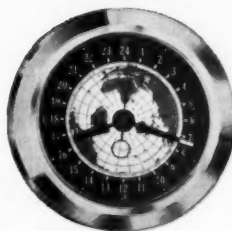
From

\$45⁰⁰

MODEL	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT
CA-1231-10	12.6 V.D.C.	300/150 V.D.C.	330/400 M.A.
CA-1252-10	12.6 V.D.C.	500/250 V.D.C.	200/400 M.A.
CA-126D3-12	12.6 V.D.C.	600/300 V.D.C.	200/400 M.A.
IA-1260-10	12.6 V.D.C.	117 V.A.C.	100W—60 CYC.

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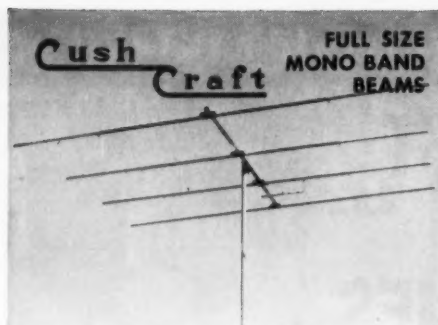
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See Page 144
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of the key. When a visitor to the shack wants to use the bug without automatic keying, the rubber band is removed, S_1 is set to MANUAL, the contacts adjusted using the monitor, and the unit operates as a straight break-in keyer with S_2 in the OFF position.

We use the monitor as a code practice oscillator, and to warm up our fists before going on the air. As for on-the-air operating, we wonder why we waited so long to get the convenience of break in, or put up with the monitoring system we used to have, which had to be retuned every time the transmitting frequency was changed. And it drifted during QSOs besides!

Do we like the automatic key? Well, we never thought our sending was so terrible before we got it, but have since concluded that "even your best friends won't tell you." Requests for repeats are fewer since we have it, and there are more good solid ragchews and fewer QRUs following an exchange of signal reports and QTHs. And that, along with building something new and making it work, is where we get our fun out of ham radio.

QST

Armed Forces Day

(Continued from page 67)

allow Armed Forces Day c.w. and RTTY broadcast competitions. Military stations will operate on spot frequencies outside the amateur bands as follows:

Station	Military Frequencies (kc.)	Appropriate Amateur band (Mc.)
WAR (Army radio, Washington, D. C.)	4020 (a.m.) 4025 (s.s.b.) 6997.5 (c.w.) 20,994 (c.w.)	3.8 to 4.0 3.8 to 4.0 7.0 to 7.2 21.1 to 21.25
NSS (Navy radio, Washington, D. C.)	4010 (c.w.) *4012.5 (s.s.b.)	3.5 to 3.8 7.2 to 7.3 & 3.8 to 4.0
	3319 (RTTY) 6970 (c.w.) 7375 (RTTY) 14,385 (s.s.b.) 14,480 (c.w.) 20,075 (c.w.)	3.5 to 3.8 7.0 to 7.2 7.0 to 7.2 14.2 to 14.3 14.0 to 14.2 21.0 to 21.25
	**14,927.5 (RTTY) see note	
AIR (Air Force radio, Washington, D. C.)	3347 (c.w.) 7635 (a.m.) 14,405 (s.s.b.) 15,715 (c.w.)	3.5 to 3.8 7.2 to 7.3 14.2 to 14.3 14.0 to 14.2

* Operator transmitting on 4012.5 (s.s.b.) will listen in the a.m. and s.s.b. sections of the 40- and 75-meter bands for a.m. or s.s.b. stations.

** NSS will key 14,927.5 kc. simultaneously with one of the RTTY frequencies listed above. This frequency will be utilized as frequency propagation conditions dictate.

Military stations will listen for calls from amateurs within the appropriate amateur bands. Contacts will consist of a brief exchange of location and signal report. This is a test of military-to-amateur communications and no traffic handling or message exchange will be permitted. A QSL will be sent to each amateur station worked. Each of the military stations will acknowledge separately.

QST

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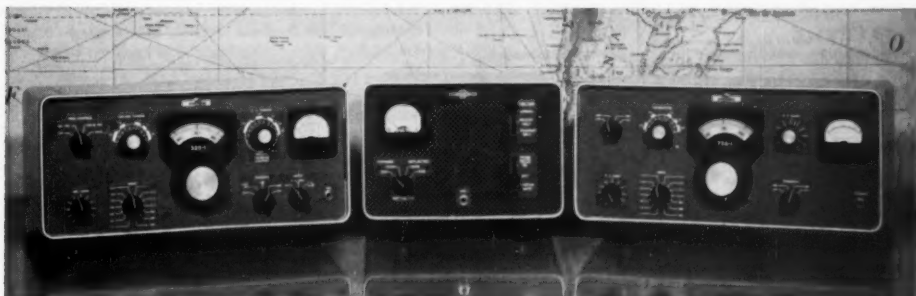
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TOWERS

ALL THE WAY - IT'S EZ WAY

See Page 144

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Exit Ignition Noise

(Continued from page 33)

Remount the high-voltage coil and connect the primary wires to the capacitor terminals. Install the spark plugs and set the completed harness in place. The shielded distributor cap should be placed carefully over the distributor and seated properly with the small shim positioned under the cap. Then connect the high-voltage leads to the coil and spark plugs. Dress the cables around high-temperature engine components and tie them down. This completes the installation job.

Results and Evaluation

The finished version performs perfectly, with all trace of ignition noise gone. The test mobile equipment consisted of a KWM-1 transceiver and a 2-meter Communicator. Since the KWM-1 doesn't have a noise clipper or limiter, reception was practically impossible before changing to the shielded system; with the engine running, the KWM-1 S meter had averaged around 20 over S-9 and only the strongest of signals could break through the noise. This condition was true on all three bands—20, 15 and 10 meters. After shielding there was no noise detectable, either on the S meter or to the ear.³ The Communicator, with its broad-band i.f., was not so susceptible to the noise as the KWM-1, but again only fairly strong local signals came through. The noise clipper helped a little but the receiver was overloaded with noise. With the shield on, the noise disappeared. The only sound discernible with the clipper off was a bit of vibrator hash from the Communicator's own power supply!

One thing this system doesn't do is cure the other fellow's noise, although this isn't as big a problem as was anticipated at first. In heavy slow traffic, when other cars are near the receiving antenna, noise will disrupt reception. However, we have found that even in normal city driving the average amount of noise from outside sources is small. When it does become excessively strong, the stand-by clipper or limiter in the receiver will usually make the noise more tolerable. One encouraging factor in this situation is that over 20 per cent of the cars manufactured today include resistor plugs as standard equipment. Perhaps some day the figure will be 100 per cent and the noise generated by other automobiles will decrease.

Several untreated cars were tested for noise by driving them up to the mobile receiving antenna. On the whole, normal communication could be carried on with the KWM-1 when the noise-generating car was 25 feet or farther away. On 144 Mc., the separation required was somewhat greater—in a few cases, as far as a few hundred yards. Tests also were made on 2 meters while driving to and from work. The squelch control on the Communicator receiver was ad-

(Continued on page 176)

³ A Collins representative advised that with normal suppression techniques an S3 meter reading on the KWM-1 was just about the lowest that could be hoped for.

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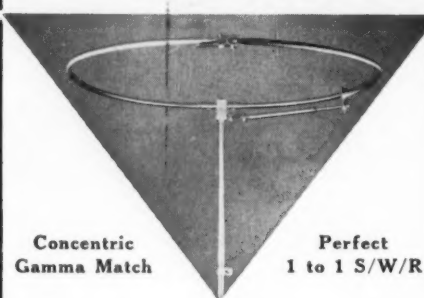


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See Page 144

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justed so that the slightest noise would trigger the receiver. When noise from an approaching car actuated the squelch, the other car's relative distance was estimated and recorded. Eventually, a list of cars which should always be given a wide berth when an important contact is in progress was compiled. Naturally, avoiding such cars is not always practical, but it is important when choosing mobile partners for transmitter hunts!

The author wishes to thank W1CJX, W1JZG, W1VON and W8JOR — the latter of the Auto-Lite Company — for their ideas and help in this project.

QST

Sweepstakes

(Continued from page 63)

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W6WMB	12,146-120-41-A-16	W4APM	13,195-	182-29-A-12
W6UWF	6,705-149-18-A-30	W4TFX	W4s APM TFX	
K6NRDU*	1580-43-21-A-16		1688-	45-15-A-4
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K4DNW	56,070-356-63-A-27
W4LYV	32,675-305-70-A-19
W4JAT	43,549-277-63-A-19
K4LXT	23,130-268-36-A-19
K4JSC	13,490-145-38-A-16
W4AGP	10,638-115-37-A-5
KN488M*	5250-65-35-A-24
KN4YEP	2220-41-24-A-15
KN4ZIW	1,605-21-12-A-14
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K4VNY (K4s RAF VNY)	70,640-448-64-A-37
South Carolina	
W4BZW	75,863-436-70-A-39
K4MUP	59,933-393-61-A-29
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W4JA	5015-59-34-A-6

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W4CXA	176,400-981-72-A-38
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W4PNK	174,150-970-72-A-34
W4JAT	166,075-911-73-A-40
K4GMX	154,530-865-72-A-39
W4BZE	138,450-780-71-A-27
W4JFE	135,975-777-70-A-38
W4GFE	135,324-743-73-A-37
W4TKR	125,825-721-70-A-40
K4CAX	123,750-750-66-A-37
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W4SNH	107,565-607-71-A-39
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W4HZZ	57,396-409-71-B-25
W4CQI	57,900-387-60-A-23
W4JQJ	57,590-450-51-A-22
W4MXU	48,705-383-51-A-31
W4FZG	46,373-344-54-A-18
K4CQM	45,600-325-57-A-30
K4JVE	42,953-252-69-A-14
W4THM	37,932-327-58-B-24
W4JLJ	33,040-207-64-A-15
K4ELG	31,894-203-63-A-16
K4KPF	27,430-21-52-A-14
VE2BX/W4	23,306-170-55-A-15

W4DAK	21,184-218-41-A-21
W4AMP	21,490-154-56-A-20
W4YE	20,300-204-40-A-9
K4REH	17,078-150-46-A-12
W4SXL	13,324-105-51-A-19
W4ATQ	11,440-143-32-A-15
W4FJ	9600-80-48-A-18
K4AK	9113-81-45-A-6

Utah	
W7BAJ	100,909-570-71-A-38
W7JQU	86,540-561-62-A-24
K7AXO	86,808-207-52-A-21
K7BNK	20,670-158-53-A-22

New Mexico	
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K5LQA	23,620-234-52-A-22
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KN5QIN	5040-71-32-A-23
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KN5QCP	1235-27-19-A-11

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W7HRM	45,490-379-60-B-22
W7HIL	36,650-234-52-A-22
W7SQY	455-14-13-A-2
KN7CRL (K7DTD, K7CRL)	18,590-166-52-A-40

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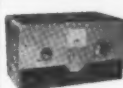
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K4IWI... 27,913-193-58-A-23
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W4PPK... 99,228-105-38-A-10
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W4VPD... 116,100-645-72-A-40
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K4RJJ... 11,788-115-41-A-10
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K4DRO... 26,000-40-26-A-2
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K4TGY... 3-1-A-1
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W4BXV... 90,304-555-68-A-24
W4ZKU... 90,000-625-72-B-40
K4EWG... 82,626-503-71-A-27
K4ATM... 79,950-492-62-A-40
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KZ5LC... 7613-88-35-A-12

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W6SBB... 146,965-865-68-A-37
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K6CYX... 100,013-572-70-A-40
K6QJV... 92,300-520-71-A-40
W6NKR... 91,901-517-71-A-36
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W6PZH... 85,520-536-64-A-40
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W7GNL... 13,178-127-42-A-18

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W6JVA... 138,883-765-73-A-40
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K6VZA... 75,438-427-71-A-36
W6ACE... 55,263-322-70-A-35
K6BLC... 44,688-275-65-A-35
K6VLA... 41,890-315-65-B-16
K6EQL... 18,143-123-59-A-9
K6LLE... 10,865-113-41-A-15
K6LLE... 6425-130-20-A-16
W6AAB... 5458-64-37-A-19
W6AAB... 5458-64-37-A-19
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W6GUL... 4000-50-32-A-6
K6NTTS... 140-8-7-A-1

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W5CNE... 76,456-475-65-A-37
W5HCL... 75,311-537-57-A-25
W5TPZ... 62,134-401-63-A-40
W5DLM... 45,744-293-65-A-29
K5IDZ... 41,260-250-66-A-40
W5RVL... 38,640-278-56-A-22
K5GHP... 31,590-235-54-A-24
K5PXY... 27,560-208-53-A-37
K5IRQ... 12,656-116-45-A-9
K5GFM... 10,593-112-38-A-12
W5LR... 5981-73-33-A-1
K5BQH... 1350-33-18-A-11
K5LSV... 525-18-12-A-4
K5DRC (K5M ATD DRC)
91,375-540-68-A-40

Oklahoma
W5YJS... 114,835-683-68-A-34
W5WZQ... 112,158-844-67-B-39
K5MRJ... 97,536-537-71-A-40
W5LW... 76,880-426-72-A-30
K5ETM... 27,030-215-51-A-27
K5BQZ... 13,892-151-49-B-7
K5SOK... 5005-80-28-A-21
W5LPL... 2013-35-23-A-8
K5SOJD... 875-32-14-A-22

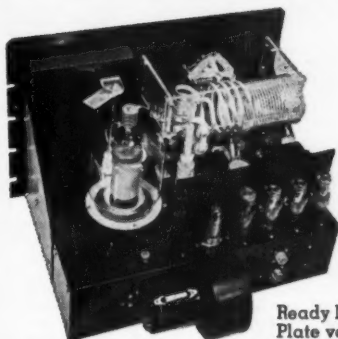
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K5LZO... 156,690-872-72-A-40
W5WZQ... 146,340-819-72-A-40
K5RHZ... 93,619-520-72-B-35
W5LGG... 78,633-443-71-A-19
K5JZY... 77,563-431-73-A-40
W5GHE... 71,190-452-63-A-31
K5JEH... 63,315-404-63-A-40
W5PVE/5... 57,520-269-56-A-30
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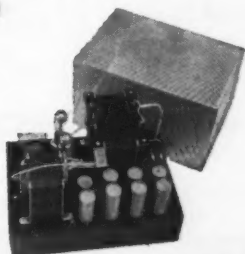
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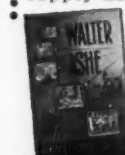
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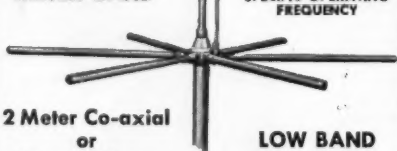
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VE2AHW	3115	45-28-A-7			
VE2AJD	2970	51-24-A-12	VE5VP 48,454 330-59-A-19		
VE2ARA	2050	42-20-A-6	VE5DZ 28,520 242-62-B-29		
VE2PZ	1575	35-18-A-	Alberta		
VE2AZI	120	8-6-A-5			
Ontario			W7P80/VE6 42,210 272-63-A-24		
VE3UOT	130,889	899-73-B-40	VE6QV 26,036 204-53-A-30		
VE3DSU	115,575	670-69-A-35	VE6UW 15,000 126-48-A-15		
VE3AGX	85,994	699-62-B-40	VE6TY 7438 85-35-A-11		
VE3EAM	75,600	500-63-A-21	British Columbia		
VE3EU	70,875	405-70-A-28			
VE3DH	67,519	416-65-A-34	VE7JO 87,675 501-70-A-36		
VE3ACB	61,880	364-68-A-34	VE7CQ 81,578 448-73-A-30		
VE3DBP	53,760	454-48-A-35	VE7LB 32,900 236-56-A-14		
W9AII/VE3	48,320	303-64-A-17	Yukon/N.W.T.		
VE3AVS	38,860	290-67-B-28			
VE3MI	29,160	324-36-A-31	VE3JW 108,186 613-71-A-35		
VE3AW	28,767	335-43-B-16			
VE3DDU	20,329	209-39-A-13			

¹ W2AAX, opr. ² W7UHK, opr. ³ W3AFD, opr. ⁴ K2JVB, opr. ⁵ W7YAQ, opr. ⁶ W1WPR, opr. ⁷ Hq. staff, not eligible for award. ⁸ W1FSJ, opr. ⁹ W4YZC, opr. ¹⁰ W0FVD, opr. ¹¹ W4HRK, opr. ¹² VE2NI, opr. ¹³ W3CDQ, W4ISS, W7PUV, W8 KJK TZO, W9QGR, W0KTR, KL7PI, VE1AR.

QST

Happenings

(Continued from page 85)

not because it is preferred to phone as such. Every technical means possible must be adopted if a useful signal-to-noise ratio is to be achieved, including particularly the use of high-gain rotatable directive antennas.

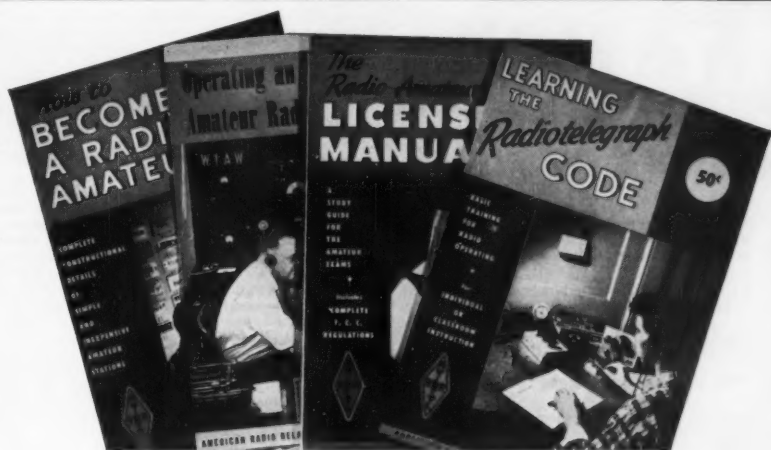
It is a well-established characteristic of antennas of this type that high gain is secured by sacrificing bandwidth. In the larger antenna arrays such as are used for this work the optimum performance is secured, at 50 Mc. for example, over a band of only 200 to 300 kilocycles each side of the design frequency. The antenna may be usable, although with a reduction in gain and other desirable characteristics, 400 to 500 kc. from the center frequency, but is essentially useless at frequency departures of as much as one megacycle.

Because of the nature of ionospheric propagation at 50 Mc., previously discussed, amateurs using such arrays have designed and built them for frequencies very close to 50.0 Mc. These antennas represent a very considerable investment in time as well as money, and there would be a natural reluctance to modify them for 50.9-51.0 Mc. since that frequency offers only the prospect of much-reduced opportunity for interesting work in the field of ionospheric propagation. Aside from this, it should be appreciated that this type of work is by no means the only activity in which these operators are engaged. They, too, participate in ordinary domestic communication, and since the various types of ionospheric communication discussed above are the exception rather than the rule, it follows that such domestic communication occupied a large proportion of their available operating time. As the Commission observed in its findings, this type of operating tends to concentrate near the low-frequency edge of the 50-54 Mc. band, where antennas designed for ionospheric work are principally useful.

Concerning the 144-148 Mc. band: So far as current knowledge indicates, there are no significant differences in propagation attributable to frequency within this range.

The argument for an exclusive c.w. assignment at the low-frequency end of the 144 Mc. band is essentially that this is the part of the band in which weak-signal long-distance work has in the past been concentrated; that existing equipment and especially antennas have been developed and constructed for the low-frequency edge; and that in view of the greater electrical and constructional complexity

(Continued on page 182)



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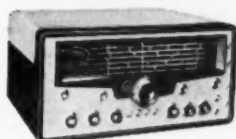
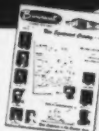
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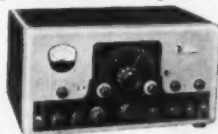


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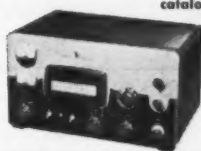
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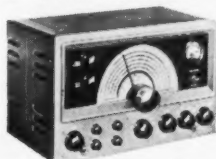
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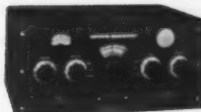
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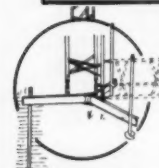
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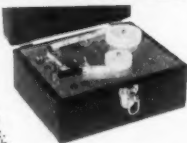
ALL THE WAY - IT'S EZ WAY

See Page 144

HENRY RADIO STORES
BUTLER, MO.-LOS ANGELES, CALIF.

What Is This Thing Called the "Hump" in CODE?

THE hump (around 8 words) is the thing that tells you you have wasted your time by starting out wrong. Thirty years ago when we started teaching Code our students too ran head-on into the hump. We went to work to find out why. TWO-PHASE, STEP BY STEP instruction in the perfect answer. In this method dotdash is not A. The SOUND resulting from dotdash is A. There is also the important factor of correct timing. If the signals are not timed correctly the resulting sound will not be correct. There are many, many things connected with proper Code instruction, many of them so small they seem inconsequential. Others are so technical that many so-called experts fail to understand them. It's a long story but I have it all written up and will be glad to send it to you. A postcard will bring you the full story.



TELEPLEX CO. 739 Kazmir Court **MODESTO, CALIFORNIA**

equipments utilized in participating in Civil Defense organizations such as MARS can be deducted for income tax purposes. This local claims to have seen this ruling in one of the issues of *QST*, but he does not remember which one.

— Michael Geller

[Editor's Note: Your friend has the wrong magazine, OM; and besides, the item was incorrect! Under certain conditions expenditures *exclusively* for civil defense activities may be deductible for income tax purposes, but this most certainly does not apply to an individual amateur's expenditures for gear which is used occasionally and incidentally for RACES drills, etc.]

CODES?

2616 Lyndhurst
St. Louis 21, Missouri

Editor, *QST*:

There has been much discussion recently in the St. Louis area regarding the use of the much-popularized "Ten" signals commonly in use by law enforcement agencies. Some amateurs contend that they are strictly illegal. We have not yet been able to have the term "illegal" completely defined. Some contend that the "Ten" signals, of which there are about 100, are top secret and should not be known by persons other than law enforcement officers, while others believe that their use is in violation of FCC regulations.

I should appreciate your comments on this matter and your interpretation of FCC regulations relative to the use of these so-called secret codes.

— Stephen B. Godwin, K0PXI

[Editor's Note: The amateur rules prohibit the use of codes and ciphers when the intent is to conceal the true meaning. Inasmuch as the "ten" code is not secret, its use by amateurs is permissible.]

TIME

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Editor, *QST*:

It's high time *QST* got on the ball and quit this silly business of quoting times (contest and the like), in PST, PDST, MST, EST, CST and all the other ST's. Soon we are going to have NYST (New York Standard Time) and NYCDST (New York Central Daylight Saving Time) and TMWNYST (Twenty Miles West of New York Standard Time.)

There's only one time in world-wide radio communications and that is GMT. Why can't all hams use this? Our logs would then be in time phase — very useful when checking QSL cards — and there would be none of this agonizing mental arithmetic while rattling along on the bug. We have enough confusion on our hands as it is without this added confusion of times. So, let 1959 be observed as a "Use GMT Year."

— Jack Campbell, VE8MX

All DX contests announced in *QST* show GMT. However, experience has proved there is no point in showing a local QSO party — such as the Wisconsin QSO Party only to Wisconsin hams — in anything but CST. New amateurs are sometimes confused by conversion to the 24-hour clock (i.e., where 9:30 P.M. equals 2130), and even more so by conversion from local standard or daylight to GMT where the date can be affected. Moreover, for reasons involving the contest concerned, the ARRL Novice Roundup, Field Day and V.h.f. Parties start on a local time basis. This cannot be expressed in GMT because the beginning time varies with the time zone of the participant.

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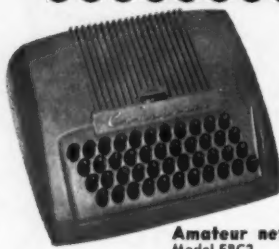
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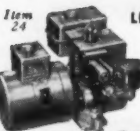
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How's DX

(Continued from page 76)

has been pushing phone on 15 and 10. . . . FK8AS takes a dimming view of possible ZM7 outings on his part. . . . ZL3DX & Co. aspire to a multiband VR5AC-ZK2AC-ZM6AC onslaught later this month, mainly on 20 sideband. . . . VR2DA is considering year's-end VR5 and/or ZM7 plausibilities. . . . A full-fledged CR10 probe appears imminent, probably KWM-1 style. . . . Ex-VR3A now seeks to carve another DX niche in the NH. . . . VK9s XM and XN keep Christmas Island intermittently available, 20 preferred.

Europe—ON4QX intends to concentrate this month's 3A2CZ activity on the low c.w. edge of 20, according to a dispatch from K4DKX. . . . K4QJL and F7CV (W4ZJY) report on Americans in Paris and vicinity: KN8SDY is QRX for his Technician ticket and F7 label. . . . W5WNF, newly licensed as F7FO, works the world on 15- and 20-meter sideband. . . . F7DI is QRT and home-ward bound. . . . F7DJ likewise in mid-March. . . . F7BX moves toward s.a.b. activation. . . . Yanks in France now are authorized mobile operation and inputs up to 400 watts. . . . F7CV has a fresh WAC tapestry but finds WAS elusive. "In almost eight months of operation here on 20 c.w. I've heard only two W7s."

K1BV1 brings us up to date on MARS action in Spain, currently the nearest thing to hamming there so far as Yanks are concerned. "At present there are six authorized and operational MARS unit stations here. The oldest and NCS, AJ2GA, has been in operation more than three years. Several more are expected to be authorized in the near future."

OY7ML's late single-sideband splurge netted some 700 QSOs in 54 countries, about 75 per cent of all activity involving W/Ks. Martin and the many who captured their first Faeroe s.b. contacts have K6AXS to thank for the loan of that KWM-1 transceptor. . . . W6VLH goes to Rome for the rest of this year and inquires as to HV operational opportunities. . . . IIDFC and friends fired up 11EZZ/M1 for much 28-Mc. s.s.b. fun this spring. W8CKB being one of the early birds. . . . Continental snippets shipped by W6KG: W4KAC goes to Greece this month with hopes of Greek operations. . . . Czech globe-gliding expedition (OK7HZ) plans should be bearing fruit by now, possibly putting Albania on the air at the first stop. . . .

From KASCW/mm: "I'm working on getting a Greek license and may be able to visit Rhodes occasionally." SV0WP (W3JTC) interests Dick in the autonomous republic of Mount Athos, the smallest of Greece's departments and a religious community purportedly off limits for all females. . . . You never can tell, anymore. G3CQE and buddies drew the tag GB3GD for their planned Isle of Man swoop last month. K9EET states that a KWM-1 and 3-cl. Mosley spinner set the boys up strong for the throng. . . .

Russia's world-wide phone contest in mid-March was announced much too late for QST coverage but W1AW carried the ball. You're missing the boat if you don't audit the Maxim Memorial Station's bulletin transmissions at least twice weekly, lads. . . . W2VZV and colleagues welcomed Poland's first s.a.b. ham station, SP3PI, also operated by XYL SP3SQ, to the DX scene. Julian peaks 150 watts on 10 through 80 meters. Ws 2MA 38X and 2VZV were SP3PL's first U. S. sideband contacts in that order. . . .

WVDXC understands that HA5A71 discounts any early HA5AM/ZA possibilities. . . . WGDXC observes that SM5WN/LA/p ticked off some 400 QSOs in the opening '59 ARRL DX Test period and still pursues Ark., Idaho, Me., the Dakotas and Utah.

Hereabouts—WITS brings up a suggestion we've heard before but he gives it a hard logical sell: Why not designate a testing segment to be voluntarily employed when loading up antennas, checking TVL etc., on our busiest band, 20 c.w.? Each kilocycle on 14 Mc. is a precious commodity, as any prefix-hunter will agree, and there's far too much A8 emission messing up QSOs day after day. Most of this key-down stuff is superfluous, to be sure, but the remaining necessary testing is still too heavy to be ignored. Don recommends that 14,100-14,110-ke. slot as a starter, a specification that should make neither phone nor c.w. factions very unhappy. Now how do we roll the ball? It's up to you, of course. . . .

Eva and Alex of old CN8MM now reside in Sao Paulo. PYICK (PY0NA) says the prominent DX duo hope to become PY2 DXers directly. . . . K2UYG notes that an 11-year-old neighbor is a nephew of contest-conqueror W9IOP. The lad has become a 2nd ardent s.w.l. but can't see how anyone can possibly enjoy c.w. work. Time for an avuncular explanation of the birds, bees and bug, Larry? . . .

W8WDZ, now KA2DZ, brushes us up on our Fletcher Ice Island ham history: "Yours truly was the first amateur on and to operate from T-3. Call signs we used were KL7AGP/mm and MARS AK1BI; the period of operation extended from April through June of 1952. There were only 36 king-size QSL cards with T-3 postmarks on them forwarded for this activity. I can't recall for sure, but either W7LTK or W6NCP scored the first

(Continued on page 188)

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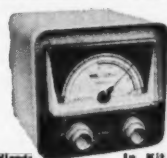


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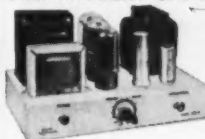


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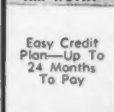
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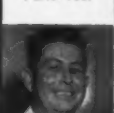
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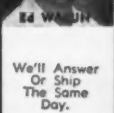
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See Page 144
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QSO with Fletcher's Ice Island." K4IGD claims the world's DX and miles-per-watt records for his outfit, the Army Ballistic Missile Agency, as a result of the performance of Pioneer IV. Come to think of it, 400,000 miles on 180 milliwatts is quite a stretch. This was v.h.f. monkey business but K4IGD of Redstone Arsenal is an avid 15- and 20-meter c.w. DX man. . . . Don't forget the concluding session of Radio Society of Bermuda's W/K/VE contest on the 8th-10th of this month, men. . . . W9UBI managed to squeeze in a DXCC between atomic physics homework sessions, a neat trick in these days of complex scholarship sessions. . . . W6TT, Ks 2IQJ and 3EFR recently dropped in on KP4KD and, with about 800 contest QSOs in February, Ev wonders where that month went. KP4KD nears phone DXCC membership status now. CE0ZA made it 241 worked, all told. . . . "San Diego DX Club's DXpedition to Mexico's Socorro Island is canceled on word from XE1YF that only Mexican citizens will be permitted to go there. All-Mexican XE4B may be heard before June." This heartbuster from W6CAE. . . . W9IHN was visited by VK3AZW for three days in February. Chuck writes, "Strangely enough, on the first night he was here we raised VK3CA right off the bat, an old buddy and only three miles from VK3AZW's home — no sked!" . . . Niagara Frontier DX Association offers a "DX Signal of the Month" award to bombshell-type DX stations. W2GBC tells us that CE0ZA won it handily for January. . . . K2QXG points out that Serrana Bank has been added to the list of areas to be counted toward his "20-K" certification. . . . W8UJR and T2HPH were on the "DXCC" brink. . . . Cute ARRL Test approach by W2HMF: "Worked one station in each country heard and came out with 110 countries in about 16 hours of the first c.w. week end. From checking with other participants I gather there were at least 130 countries workable, so I guess I'm not such a good snooper." ARRL Hq. W1s ICP and WPO multiopped for 97 countries in the Test's opening session. [Boss, did it really take you twelve years to make DXCC? — Jeeves] "Yes, Jeeves, but we really didn't try hard till we got to No. 17 confirmed." . . . Miscellany provided by DXCSL, OVARA, VERON and WGDXC: The green light is a glimmering for the Ohio Valley group's projected Guadeloupe gallop. . . . W4JRD/KS4 is due back home after a low-pressure 14-Mc. San Island solo. . . . ZL1AV, visiting K9ECO, would like to wend his way homeward in the company of VP2VB/mm aboard Yasmie II. Danny now takes a breather as VP2GDV after salvaging some twenty crates of paraphernalia from the battered hull of Yasmie II, abandoned after becoming rockbound in the Grenadines early this year. . . . The KS4BB party's voyage toward Serrana Bank was so interesting and so well radiated around 14,050 kc. in mid-March that the land-based activity itself came almost as an anticlimax. KV4AA served as n.e.s. for YN4DLS/mm Stateside liaison. W3WV, who arranged invaluable radio bearings for the lads from time to time through Navy facilities, is W3PZW's OM, in case you didn't know; which fact added a family flavor to the whole affair. Well done!

Ten Years Ago in "How's DX?" — A dire need for innovations in the DX field is stressed by the prologue of your May 1949 column, including allocation of auto-ignition frequencies other than 10 and 20 meters. . . . W4JQ's postwar 75-meter phone WAC is said to have been clinched by JA2AT, W9AND and VE7HC add 80-c.w. all-continent claims, and W4BRB reached the 3.5-Mc. sixty-country mark. Goodies on 80: F8RBB, HA5B, HP1BR, JA3AA, KG6DI, KW6AP, OX3BC, TG9JK, VP2LX, VY4AW, ZBIAR and Z86DW. . . . Forty's favorites appear to be FM8AD, FT4BA, GD3UB, HA4SA, HR1AT, SU1CR, UA9FB, Ws ILBW/C1 881R/KG6, ZCs 6UNJ and 8PM. . . . Twenty-meter code reports dwell upon C1JH 4RK, FT4AJ, M13ZZ, VK1VU, VR5e IP PL, roving Ws 6YNK/HS 6ZNT/KW6 HWI/KS6 6MCF/C3, YK1AF and ZC1CL. Fancied on 14-Mc. phone are AC4RF, AR8BC, FQ8SN, FT4AT, MD4BPC, M13SC, PK4DA, VR3C, VS7NX, Nepal's VU7AF, YK1s AA AB and ZC1AZ. . . . Ten eases pace but produces MB9BN, MF2AA, MT2E and VE3A, on voice. LX1AC and TB3GV on c.w. . . . There's a note on the formation of the Ohio Valley Amateur Radio Association with a flock of crack DXers involved. . . . Well-worked VK3MC appears photographically, and Jeeves finds himself somewhat up a tree. QST

World Above 50Mc.

(Continued from page 79)

reached. The cycle is then repeated. Tone modulation is used to facilitate copying the signal on receivers not equipped with beat oscillators. A frequency in the 2-meter band will be added later, if interest warrants. This info is from W3LDA, trustee of the station.

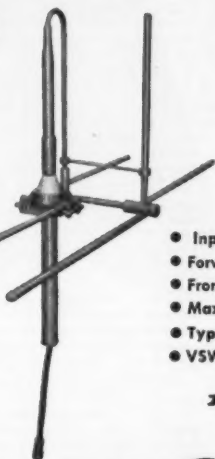
After several years of informal meetings of the v.h.f. men of the Portland area, the group have organized the Columbia River V.H.F. Society. Members come from Vancouver, Hillsboro, Gresham, Clackamas and St. Helens. (Continued on page 180)



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See Page 144
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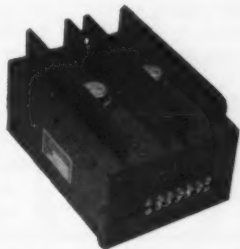
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as well as Portland. Meetings are held the third Friday of each month at the Oregon Museum of Science and Industry. An AREC Net operates each Thursday at 2000, and is followed by a RACES Net at 2100; both on 50.55 Mc. The club will be operating a station in the June V.H.F. Party, and all interested parties are welcome, says W7HIO.

We left out a few details in the report of the Royal Order of Hootows, March QST, p. 70, according to W7YJE. Lee points out that anyone can become a Hootowl by working another member of this outfit on 50 Mc. - but the QSO must take place at midnight Saturday, and last one hour. You must then apply to W7YJE, enclosing 25 cents to cover the cost of the certificate and mailing. Nominations must be confirmed by the member station worked. The date of the ROHO Picnic has been changed to June 21, instead of the 14th as originally reported. Place: Gaffney's Resort, Lake Wilderness, near Renton, Wash., 0900 to 1300.

The Badger V.H.F. Club of the Milwaukee, Wis., area was formed to handle the production of a paper, the V.H.F. News, formerly put out by K9IQO, but abandoned when it became too much for George to handle alone. Officers are K9IQO, president, W9MMA, vice-president, K9LMW, secretary, W9ZDI, treasurer, and W9JCI, program director. Meetings are to be held monthly at the Old Heidelberg Inn on a day not set at the time of this report.

The Ontario V.H.F. Association (appropriate club call - VE3VHF!) announces sponsorship of two v.h.f. awards, the WVE for 50 Mc. and the Century Award for 144 Mc. For the WVE, 50-Mc. two-way contacts must be made with Prince Edward Island, New Brunswick, Nova Scotia, Quebec, Ontario, Yukon and Newfoundland or Labrador. They aren't likely to be issuing this one on a production-line basis! As if this were not enough, the OVHFA states that contacts made during contests will not count!

For the 2-meter award a certificate will be issued for 50 VE3 contacts. Endorsements will be offered for 75 and 100 contacts. The no-contest provision applies to this one also. All contacts must be confirmed by QSLs. Address of the OVHFA: P.O. Box 112, Station F, Toronto 5, Ontario. Thanks to Canada's one holder of 50-Mc. WAS, VE3AET, for the above information.

As reported briefly last month, a 220-Mc. contest will be held in Southern California coincidentally with the ARRL June V.H.F. Party. Sponsored by the Inter County Net, it will run from 1 p.m. local time June 13 to 4 p.m. June 14. Suggested operating frequencies are between 221.2 and 221.6 Mc. A maximum of 24 hours operating time is permitted. Prizes will be given to member stations.

The Inter County Net is believed to be the only 220-Mc. traffic net in the country. It was organized last fall, its first session being held Sept. 29. More information from Net Manager, K1GKX, 110 Argonne Ave., Long Beach 3, Cal. Ralph reports that the changeover to horizontal polarization on 220 in Southern California is going well, with 15 stations changed over by the end of February, and more coming. With W7LEE, Parker, Ariz., using horizontal, the boys have a DX incentive.

One way to promote activity on 220 or a higher band is to set up some regular schedules. K2ITQ/3 works his brother, K2ITQ, nightly on 220, on a schedule that was formerly kept on 50 Mc., which helps. On Monday nights, the Mt. Airy V.H.F. Club 220-Mc. net gets about everyone in the Philadelphia area who has 220 gear on the air.

The 1000-mile Club certificate (December, 1958, QST, page 90) offered by the Raritan Bay Radio Amateurs has been applied for by some 25 operators, all the way from New England to California, and from Texas to Canada. It is more than just wallpaper; the 1000-mile club is intended to foster the advancement of the art of long-distance communication on all bands from 144 Mc. up. Detailed records of each member's equipment and objectives are kept. Application forms may be had from W2TTM, 90 Luke Ave., South Amboy, N. J.

OES Notes

In the reports from which these notes are compiled we know that there will be at least one or two complaints that, though the writers have reported faithfully for months, they have never seen their calls in print. No news from their area either, they say. How come? What do we have OES for?

Some OES appointees make our column regularly; others seldom or not at all. Reason: the boys who make it turn in newsworthy and useful reports month after month. Others

(Continued on page 198)

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See Page 144
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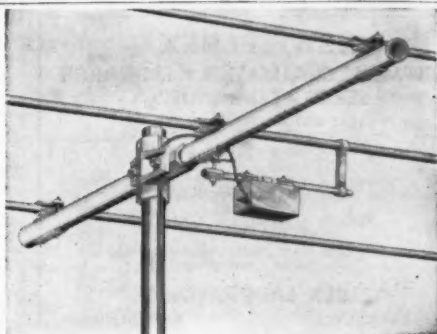
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See Page 144

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report facts that are of interest to nobody but themselves. "Nothing to report" written on an OES form time and again is merely a waste of time and postage. "Moved shack from attic to basement" is little better. That "K1XYZ has new Communicator" will keep few QST readers awake nights. And no matter how hot your news is, if it relates to frequencies below 50 Mc. your report lands in the waste-basket.

OES stands for Official Experimental Station. The E can be stretched quite a bit, and it often is, to include operating news that will be of interest to others, but this is not a gossip column. Look over the Notes in several past issues of QST and you'll see what it takes to make the column. The supreme test is whether the item will be read with interest by most v.h.f. enthusiasts. Getting anyone's call into print counts for very little. A geographically balanced presentation is more important, but it is news value that decides the issue.

Almost every ham does things that interest others. Listen to the ragchewing after any radio club meeting, and you'll hear what we mean. Anything you'd talk to others about is potential QST meat — report it promptly and in useful detail. But don't expect to see it in the next issue of QST after you mail the letter. OES reports are made to your Section Communications Manager. He in turn forwards them to ARRL. The news that follows appeared in your March 1 reports. If something of really hot-news nature happens, report it to ARRL directly, with a copy to your SCM. It may make QST one issue earlier that way.

K1AOX, Hartford, Conn. — New 144-Mc. preamp with 416B grounded-grid marked improvement over 416A previously used. Building high-level 144-Mc. a.s.b. mixer.

K1BOX, Southboro, Mass. — Local fire station getting QRM from Venezuela on 46.2 Mc.

W1EJ, Tyngsboro, Mass. — Building crystal-controlled gear for 2300 Mc.

W1FOM, Southington, Conn. — Testing 50-watt 220-Mc. rig; worked W1QVF 20 miles away, using only dipole in basement. Beam soon to go up.

W1LGE, Windsor Locks, Conn. — Last European reception on 50 Mc. was CT1CO, Feb. 12. Numerous openings to South America (PZ1AE and HC1FS) through Feb. and March.

K2ZSQ, Rahway, N. J. — Many a.s.b. signals heard regularly on 6.8 a.s.b. frequency in 50.3 Mc. (W1BOM reports that Sunday at 1100 is a rallying time, with W3HFY W2SZE K2KTH K2VIX K2TSG W1ZGO and W1BOM among the participants.)

K4EUS, Chester, Va. — Local frequency, 145.35 Mc., busy almost nightly.

W4FNR, Ft. Lauderdale, Fla. — First TE of 1959 worked Feb. 15, 16 and 17, including OA4C and LU5. W1HDDQ XE1GE WARMU W4IKK and W5VY heard simultaneously via back-scatter from south. Feb. 22, 1000 EST.

W4FWH, Doraville, Ga. — Net activity on 220 Mc. getting under way in Atlanta area. Test period beginning 0800 EST Sundays. Mondays, 2000 EST, for 2-meter net, 144.35 Mc.

K4KYL, Knoxville, Tenn. — YN1JZ, worked Feb. 15 by K4PES, first 50-Mc. sig from YN heard in this area.

K4PKK, Decatur, Ga. — Activity on 6 rising steadily. Worked 25 different locals during February.

W4RMU, Oceanway, Fla. — Called CQ nightly, each half hour, 1830 to 2200, beam south, during March and April. Objective: TE work with South America or tropo contacts with Southern Florida. Frequency 50.005.

W6OHQ, Piedmont, Cal. — Work with 432-Mc. mobile shows signals comparable to 144 Mc. in most instances, but with greater freedom from ignition noise. Maintained contact with W6OJB for 46 miles, Vacaville to Orangetown, 18 miles east of Sacramento. Mobile setup has 6524 tripler driven by Communicator. Receiver has 416B r.f., crystal mixer, and Communicator as tunable i.f. Antenna is 2-meter whip, working as 3/4 wave.

W8WRN, Columbus, Ohio — Tri-Country 6-Meter Net operates Mondays, 2000, on 51.15 Mc. March meeting of v.h.f. section of CARA was televised by W8RRJ and W8DMR, whose stations were pictured in March QST.

K9DTB, Villa Park, Ill. — Enjoying 50-Mc. a.s.b. operation. Activity on 220 Mc. improving in Chicago area.

W8ETX, McPherson, Kan. — Local net on 145.5 Mc. being readied for storm season. W8ETX transmits ARRL Bulletins on Sunday, Tuesday and Thursday, 1945. V.h.f. OBS work bringing good response.

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See Page 144
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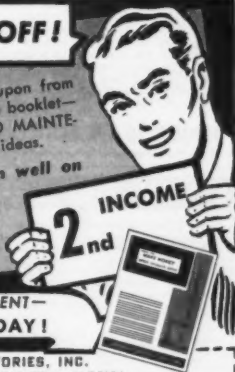
1203 Bryant Ave. (Dept. Q3) New York 59, N. Y.

EAVESDROPPING ON THIS QSO SURE PAID OFF!

The other night I was "reading the mail" — during a QSO between a W4 and a W1. The W1 said his earnings from part-time commercial mobile-radio maintenance had paid for his KW rig!

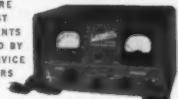
So — I made a decision — and mailed the coupon from the Lampkin Laboratories' ad in QST. The free booklet — "HOW TO MAKE MONEY IN MOBILE-RADIO MAINTENANCE" — gave me facts... figures... and ideas.

NOW — evenings and weekends — I am well on the way toward a substantial second income.



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MFG. DIVISION, BRADENTON, FLORIDA
AT NO OBLIGATION TO ME, PLEASE SEND ME "HOW
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Aluminum tower outer sections crank up first permitting each section to be guyed as it locks automatically into position... can't get out of control... one man can handle safely.

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194

Russia's Iron Curtain

(Continued from page 90)

goes from north to south. Since continental Russia does not extend very far towards the equator, it is possible, in principle, to lay transmissions down in Moscow which would be very difficult to jam from any other point in Russia, by using just the right frequency and a transmitter situated somewhere in Africa.

Let no one get his hopes up too high, however. In the first place, there are still the ground-wave jammers. In the second place, the majority of the short-wave receivers presently being manufactured in Russia will not tune higher than about 12 megacycles. (This permits Russian listeners to receive domestic broadcasts, but makes it impossible for them to receive anything above 12 megacycles, unless they use older receivers. Thus the full benefit of a southerly transmitting location can only be reaped at night, and during times of sunspot minimum.

Effect on Amateur Radio

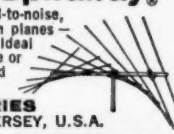
It comes as a shock to a U. S. ham to learn that in Europe the 3950-4000-kilocycle band is used for short-wave broadcasting, and that transmissions from services other than amateur also occupy the frequencies from 3500 to 4000 kc. and from 7100 to 7300 kc. During the next sunspot minimum, the world's short-wave transmitters will spend most of their time nudging each other in the bands below 12 megacycles, and the pandemonium is likely to exceed anything known in the past. For it is clear that neither side will give an inch in the cold war of the radio waves. The "barrage" will surely increase in both numbers and power, no doubt to be matched by a cacophony of equal intensity from the other side. The increase in short-wave broadcasting by many of the smaller countries also will add to the congestion of the radio spectrum.

Acknowledgment

The writer wishes to thank Mr. G. H. Chapman, Manager of the Munich Relay Base of the VOA, for his many kindnesses, and Mr. Edgar T. Martin, Engineering Manager of the VOA system, for permission to publish this article. Mr. J. C. Miller has provided useful information. **QST**

New! Telrex "Spiralray"

Extremely high-gain, high signal-to-noise, practically no fade, all radiation planes — horizontal, vertical or oblique! Ideal for scatter-wave, satellite, mobile or point to point work! 50, 108 and 144 megacycle models available



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UNUSUAL OPPORTUNITY

for inexperienced man who wants on-the-job training in TV transmitter operation. First phone required.

BOX 185, QST

TOWERS

ALL THE WAY - IT'S EZ WAY

See Page 144

AMATEUR ELECTRONIC SUPPLY
FOND DU LAC-MILWAUKEE, WISCONSIN

The HI-PAR 6 Meter Broadband Ring Antenna



PRICE
\$16.95
NET

Fills the need for improved omni-directional antenna for fixed or base station. Electrically, it consists of a half-wave-length radiator (without end loading) and incorporates the improved "Gamma-Match" feed system pioneered by Hi-Par which gives increased bandwidth with extremely low V.S.W.R. Impedance matching is given for standard 52 ohm series cables; RG/8U, RG/58U, etc., making the stacking of two or four units practical.

MODEL 6-R SPECIFICATIONS

Design Center.....	50.5 MC or as specified
Polarization.....	Horizontal
Radiation Pattern.....	Essentially Circular
Gain (compared to a straight half wave dipole).....	9
Impedance.....	52 ohms
V.S.W.R.....	1:1 at design center
Diameter.....	Approx. 39"
Net Weight.....	2 1/2 lbs.
Shipping Weight.....	7 lbs.

HI-PAR PRODUCTS CO.

FITCHBURG, MASS.

PREMAX



SA-1 Spring Adaptor

Premax stainless steel SA-1 Spring Adaptor reduces riding shock and allows easy fold-down of antenna when parking in low garages, etc. Fits Premax R-2 or CA mountings.

R-2 Universal Mounting



Strong and practical. Solid aluminum split ball adjusts to any angle. Heavy phenolic insulator disc has moisture-proof gaskets. Coax fitting and grounding backplate included.



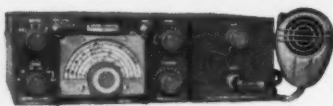
CA Bumper Mounting

Fits any bumper, even massive new models, without drilling splash pan. Fully adjustable with 9 removable links. Braided copper ground lead included.

PREMAX also designs and builds a complete variety of center loaded, whip, motorcycle and roof antennas for mobile patrol and marine use. Write PREMAX for complete information.

PREMAX PRODUCTS • Div. Chisholm-Ryder Co., Inc., 5911 Highland Ave., Niagara Falls, N. Y.

NEW PALCO BANTAM B-65A



The smallest, most compact Mobile Transmitter with 65 watts phone . . . 90 watts c.w.

The PALCO B-65A is only 4" high, 8" wide and 8 1/4" deep. It can be mounted right at your finger tips, leaving lots of leg room. Companion modulator is only 4" x 4" x 9", can be mounted alongside RF unit or tucked away under the dashboard. Exclusive new tuneup meter designed with *highway safety* in mind. No stooping — no squinting with this one.

New Super Stable VFO. Provisions for two crystals. Complete bandswitching 10 thru 80 meters. Efficient wide range pi-network output. Panels are bright chrome, with contrasting grey knobs. Push-to-talk phone. Power requirements: either 6 or 12 volt AC or DC filament supply. 450-500V DC at 250 Ma. Tubes: 6BH6 VFO, 6BH6 buffer, 5763 buff-dblr, 6146 ampli., OAG reg., 6AQ5 clamper. 12AX7 audio amp-driver, two 1614 mods. Makes an ideal Novice xmitr when operated at 75 watts input.

Amateur Net: inc. mntg. bracket, RF and Mod. units, w/tubes and interconnecting cables . . . **\$179.50**
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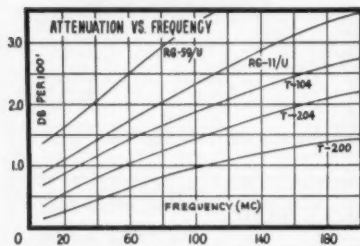
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355 N. Columbia

Frankfort, Ind.

the paths of least resistance



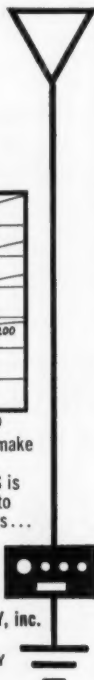
Choice of the right transmission line can make a world of difference (See QST, April, 1959) — whatever your choice of antenna or rig. TIMES is the coaxial expert, an organization dedicated to the design and production of better conductors . . .



Write for details on low-loss coaxial cable types . . .

TIMES WIRE AND CABLE COMPANY, inc.

... an affiliate of
THE INTERNATIONAL SILVER COMPANY
Wallingford, Connecticut



World Above 20,000 Mc.

(Continued from page 16)

considered, the resulting expression⁵ becomes

$$F'_{rec} = L(t + F'_{i.f.} - 1).$$

$F'_{i.f.}$ is the effective noise figure of the i.f. amplifier, and it is the noise temperature ratio of the crystal. $t_{i.f.}$ is equal to the ratio of the available noise power output from the crystal to that of a resistor at room temperature. $F'_{i.f.} = 10$ db, or $10 \times$ for a television set tuned to Channel 2, $t = 2.5 \times$, and $L = 8.5$ db, or $7 \times$ for 1N26 crystals at 21,000 Mc. Hence, substitution in the above equation yields $F'_{rec} = 80 \times$, the ratio of receiver noise power to that generated by a resistor equal to the input impedance R of the receiver (300 ohms). The r.m.s. noise voltage V_{noise} of such a resistor over a band width $B = 4$ Mc. is $V_{noise} = \sqrt{4kTBR} = 5 \times 10^{-6}$ r.m.s. volts. k = Boltzman constant, and T = absolute room temp. The noise

power is $\frac{V_{noise}^2}{R} = 8 \times 10^{-14}$ watts. Hence, the

absolute magnitude of the minimum detectable power W_R is $(80)(8 \times 10^{-14}) = 6 \times 10^{-12}$ watts.

The amount of power received W_R at a distance d is related to the amount of power transmitted W_T as follows:

$$W_R = W_T G f e^{-\alpha d}$$

G is the antenna gain, f is the fraction of power intercepted by the receiving antenna at a distance d with inverse square law scattering, and α is the attenuation due to water vapor. For parabolic antennas of diameter D operated at a wavelength λ , we may express the above equation in decibels as

$$10 \log_{10} \frac{W_R}{W_T} = 10 \log \frac{4D^2}{\lambda^2} + 10 \log \frac{D^2}{4d^2} - \frac{1}{2} \alpha d (\text{db}).$$

Using $W_T = 10^{-2}$ watts, $W_R = 10^{-9}$ watts, $\alpha = 1/2$ db./mile, corresponding to 50% relative humidity, $D = 15''$, and $\lambda = 1/2''$, we compute d to be about 150 miles. QST

⁵ Torrey and Whitmer, *Crystal Rectifiers*, 15, Radiation Laboratory Series, McGraw-Hill, New York, N. Y. (1948), page 25.

Amateur and Public Relations

(Continued from page 82)

under existing rules the amateur is obliged to investigate *each* case of BCI or TVI to determine whether or not the fault lies within the transmitter, even though it has been pronounced "clean" by WTVIC standards.

Transmitter and transmission line troubles *do* develop, and changes in equipment and circuitry, synonymous with true hobbyism, may cause interference to your neighbor's television reception, but not to your own monitor television receiver.

What can you do during the waiting period — until the manufacturer provides a filter or other needed remedy for TVI?

Many amateurs limit their operations to other than the more desirable TV program hours.

(Continued on page 198)

QTC?

Whether you are a dyed-in-the-wool traffic man or just an occasional trafficker, your sense of good public relations tells you that ARRL Radiogram forms are a must in your station. Attractively printed on a new high grade paper, message blanks add that final touch to this important public service.

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ALL THE WAY - IT'S EZ WAY

See Page 144
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CHICAGO, ILLINOIS

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Model #14, 15, 19, 26 & 28 Teletype machines-
Telewriter Receiving Converter and others. For
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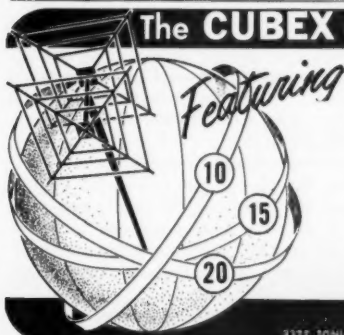
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WRITE FOR FREE BROCHURE "MK"

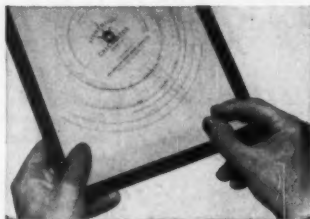
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How Many Turns?



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ARRL LIGHTNING CALCULATOR

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THE AMERICAN
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West Hartford 7, Conn.

Others maintain the good-will of their neighbors by "keeping in touch." Let your neighbor know that you are still vitally concerned in reaching a mutually agreeable solution to your common problem. You understand their predicament, for you too, and your family, own television receivers. Some amateurs lend their neighbor a high-pass filter, or install a suitable home-made trap on a temporary basis. These installations — on the outside of the affected television receivers — work remarkably well, but many cases can be cited where set owners are so pleased with the effectiveness of the trial installation that they are reluctant to permit removal of the filter for further use by the committee. If one particular frequency band or section of a band causes interference, it is wise to refrain from operating there until remedial measures have been taken. A temporary reduction in operating power may help in some cases.

Since you never know when your neighbor may be unwillingly "listening in," it is wise to limit "on the air" discussion concerning local TVI problems. Your neighbor may misinterpret the most innocent remarks.

Imagine the chagrin of the amateur when informed of this occurrence. Recently one particularly incensed television set owner advised our office that at the time she reported interference directly to an amateur he continued his radio contact during telephone conversation with her. She could hear his voice through the television receiver as well as through the telephone. Later, through the television receiver, she heard the amateur refer to her as "that character down the street."

Believe me, your committee coordinator and I know that these situations develop to the point where a satisfactory solution consumes time and patience all out of proportion to that normally required, for it may breed an epidemic of unreasonable resentment throughout an entire neighborhood.

Never, but *never* "knock" the complainant's receiver, even though it is a time-worn relic. Remember, you won't be able to explain away the obvious fact that the receiver works fine when you are off the air. Again, your technical reasoning may not be understood nor appreciated, and what you do *not* say cannot be misinterpreted.

Carefully avoid putting him on the defensive. Above all, be a good listener, as long as needs be. Try to place yourself in your neighbor's situation, and, again, employ in effect, the Golden Rule. After you have gained his confidence you might sound out a factual note.

It is an honored privilege to operate an amateur radio station. Whether or not you are at fault, and whatever the cause, be on your guard for opportunities to serve your neighbors in BCI and TVI matters. Only in this manner can you assure for those who follow, the same privileges you now enjoy.

In the process you will also affirm the right of the amateur to the frequencies he now holds. **QST**



We Invite You To Compare
AS WE HAVE, SAYS LEO I. MEYERSON, WØGFQ
THEN ORDER THE WORLD'S TOP 3-BAND BEAM

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Compare Size

Compare the Hy-Gain Full Size Trap Tribander with any other trap tribander in the industry. You will find it is the only one that has both full element spacing (.25 wave length boom on 20 meters) and full sized elements (longest element 32'). This amounts to almost a third more metal than smaller tribanders selling for the same price. If you have a space problem, buy the Hy-Gain Miniature Tribander at a savings of \$30.



Compare Construction

Hot dipped galvanized steel boom 1½" in diameter for maximum strength with lowest possible wind loading. Boom braces form rigid angular boom to mast assembly. Heavily plated 10 gauge steel channels attach all elements to boom and boom to mast with positive grip. Elements are 6061T6 high strength aluminum alloy; - 1½", 1", ¾" and ¾" in diameter. All hardware is galvanized and irridite treated offering superior weather resistance. Hy-Gain's streamlined traps (only 2x3") together with steel boom construction result in the smallest wind loading area possible in a full sized tribander.



Compare Matching

Exclusive Hy-Gain Triaxial Gamma Match System with coaxially formed reactance cancelling capacitor built in makes possible for the first time a perfect 1:1 SWR on a three band antenna. Although factory precalibrated, it is also adjustable to compensate for variations which may be encountered at each installation site. Exceptional bandwidth maintains low SWR over the entire band. The use of this matching system permits tuning the array for maximum gain with no compromise to facilitate matching.



Compare Traps

The Streamline Hy-Gain Traps are small (3" in diameter) and light weight. They actually have less wind surface area than any other trap manufactured. Capacitor, dielectric and coil form moulded high impact styron. They are designed to take 1 KW AM, 2000 watts PEP. Individually factory resonated for maximum frequency energy and completely factory weather sealed, water proof and air tight (do not breathe) for years of stable operation. Carbon activated polyethylene covers. High Q coils well removed from any metal mean highest efficiency of isolated action.



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Hy-Gain's High Q Traps result in minimum element loading and true full sized performance. The longest element of approx. 32' together with full size 18' boom spacing results in a tribander beam with full 8 db gain and 25 db front-to-back ratio. No smaller 3-band beams can develop this gain. In addition, Hy-Gain does not compromise by detuning parasitic reflector and director to raise feed point impedance of array so that it can be fed split dipole with a 52 ohm line. Instead, the Hy-Gain Tribander is tuned for maximum forward gain and the matching is accomplished by the Tri-axial Gamma Match System.



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Hy-Gain's tremendous Ham Acceptance and large volume production makes possible the lowest price in the industry for a full-sized three element tribander; - \$99.75.



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(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part, capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which in our judgment, is obviously non-commercial in nature. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 7¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

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MOTOROLA used FM communications equipment bought and sold W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

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WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

KWM-1 wanted. Also few high plate dissipation tubes, radios BC348, ARN14, ARN30, ARC3, 51 Series Gear 51J, 51R, communication receivers, transmitters. Dames, W2KLU, 308 Hickory, Arlington, N. J.

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COAXIAL Cable. New surplus RG-54A/U, 58 ohms impedance—30 ft. prepad, \$1.00. Radio magazines, buy, sell, trade, R. Farmer, 3909 No. Columbia, Plainview, Texas.

KNOX Electronic Supply, Inc. "Where your Trade-In is always worth more!" 67 N. Cherry St., Galesburg, Ill.

ANTENNA 80-40-20-15-10, \$21.95. Patented. Lattin, W4JRW, Box 44, Owensboro, Ky.

HALLCRAFTERS, Drake, Central Electronics, Gonset, Ham gear, Jerry WSEPL, Swartzlander Radio Limited, 1220 Stillwell Avenue, Fremont, Ohio.

FIFTH Annual Syracuse VHF Roundup, October 10, 1959.

WANTED: Battery receivers of 1920s. Erla, Acme, Radiola, Grebe, etc. Also U V199 thru U V296 tubes for electrical test. Buy or borrow. Grote Reber, Green Bank, West Virginia.

WANTED: Edico 1000F amplifier. CDR Ham-Rotor. Sell: 6 Ke 75A4 filter, \$25. WACQP, 1351 Bolling, Norfolk, Va.

QSL'S? SWLS? Finest and largest variety samples, 25¢ (refunded). Callbooks (latest), \$5.00 postpaid. Religious QSLs, samples 10¢. Request free folder. "Rus" Sakkers, W5DED, P.O. Box 218, Holland, Michigan.

QSLs of rare excellence. Samples 10¢. Dave, 601 East Maude, Sunnyvale, Calif.

DELUXE QSLs, Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

QSLs "Brownie," W3CJL, 3110 Lehigh, Allentown, Penna. Samples, 10¢ with catalogue, 25¢.

QSL Samples, Dime refundable. W3KJP Press, 1806 Water, Wesleyville, Penna.

QSL-SWLS. Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

QSLs, SWLS, Stationery, samples 5¢. Nicholas & Son Printery, P.O. Box 11184, Phoenix, Ariz.

QSLs: Twenty exclusive designs in 3 colors. Rush \$3.85 for 100 (ten different kinds) or \$6.25 for 200 (20 different kinds) and get surprise of your life. Satisfaction guaranteed. Five days service. Constantine Press, Bladensburg, Maryland.

QSLs, Sharp! 200 one color, glossy. \$4.75 Multi-color samples dime, K9DAS QSL Factory, Edward Green & Sons, 4422 Marquette Dr., Ft. Wayne, Ind.

QSLs, Samples, dime. Printer, Corwith, Iowa.

COLOR Glamor, scenic & nature. Custom sketch and photo. Samples 25¢ refunded. K4LFE QSLs, Summerfield, Fla.

QSLs: 4 colors, glossy, 100. \$3.00. Samples 10¢. Dick, W8VXK, 1018 Arthur, Mt. Pleasant, Mich.

QSL-SWLS. Samples free. W4BKRT Press, McKenzie, Tenn.

QSLs, Reasonable, 10 days delivery. Catalog dime (coln). Dick, K6GJM, Box 294, Temple City, Calif.

SCENIC QSLs, New, beautiful, samples 10¢. Camas Press, 3005-VC, North Hollywood, Calif.

QSL-SWLS that are different! Colored embossed card stock, and "KroKote." Samples 10¢. Turner, K8AIA, Box 953, Hamilton, Ohio.

QSLs, SWLS, \$3.00. Samples free. Bolles, 7701 Tisdale, Austin 5, Texas.

QSLs, SWLS, Samples 10¢. Ononodaga Press, Ononodaga, Mich.

QSLs, Outstanding, original, fast service. Reasonable prices. Samples 10¢. Super quality. Quantity, 25¢. Refundable. VYS QSLs, 1704 Hale, Ft. Wayne, Ind.

CREATIVE QSL and SWL Cards. Are you proud of your card? If not let us print your next order. Write for free samples and booklet. Personal attention given to all requests. Bob Wilkins, Jr., KN5ZMT Creative Printing, P.O. Box 1064-C, Atascadero, Calif.

QSL Samples dime. Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSL-SWLS. High quality, reasonable prices. Samples. Bob Teachout, W1FSV, 204 Adams St., Rutland, Vt.

QSLs, SWLS? In 15 try mine! Sample assortment approximately 95¢. 6" overline designing, planning, printing, arranging, mailing, eye-catching, comic, sedate, fabulous DX-attracting, prototypal, snazzy, unparagoned, cards. Rogers, K9AAH, 737 Lincoln Ave., St. Paul 5, Minn. Also glamorous, pulsating (Wow!)

QSL-SWLS, 100 \$2.50. Samples 10¢. QSO File cards, \$1.00 per 100. Rusprint, Box 7507, Kansas City 16, Mo.

QSLs, Taprint, Union, Miss.

QSLs, rubber stamps, reasonable prices, nice designs, samples dime. Stan, W2DJH, 19 Elm, Warrensburg, N. Y.

QSLs, Glossy, samples 10¢. WITBB Press, 807 Main St., Winchester, Mass.

QSL-SWL samples free. Bartlinski W2CVE Press, Williamstown, New Jersey.

QSLs: Send 25¢ (refundable) for samples. W6CMN, Schuch, 6707 Beck Ave., No. Hollywood, Calif.

QSLs, Plain or fancy, samples dime. QSL printing, Box 12351, Houston 17, Texas.

QSL-SWLS, 100. \$2.85 up. Samples 10¢. Griffith, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSLs Atlas Missile, 100 Glossy 4-color, \$4.00. Paye, W4ZKK, 824 Avondale, Cocoa, Fla.

QSLs? SWLS? In 15 try mine! Samples 25¢ deductible. C. Fritz, 1213 Briarclate, Joliet, Ill.

QSLs, 3-color glossy, 100—\$4.50. Rutgers Vari-Typing Service, 7 Fairfield Rd., New Brunswick, N. J.

QSLs samples, quarter. Spicer, 4615 Rosedale, Austin 5, Texas.

QSLs, High gloss, 2 colors, samples 10¢. K2VOB Press, 62 Midland Blvd., Maplewood, N. J.

QSL Special. Free sample. Nat Stinnette, W4AYV, Umatilla, Fla.

QSLs: Cartoons, colors, something different. Samples, 25¢. Chris, W9PPA, 365 Terra Cotta, Crystal Lake, Ill.

QSLs, RWLS, Citizen's band. Samples 10¢. Ononodaga Press, Ononodaga, Mich.

QSLs, Stamp brings samples, Eddie W. Scott, W3CSX, Fairplay, Md.

QSLs, 100 for 30.00, glossy, samples free. R. A. Larson, 32 Milland Ave., Stamford, Conn.

QSLs, Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSL-SWLS, 50 card bonus on order of 500. Samples 5¢. Nicholas & Son Printery, P.O. Box 11184, Phoenix, Ariz.

QSLs, Lapel pins, samples dime. Kephart W2SPV, 4309 Willis, Merchantville, N. J.

QSLs Neat, Attractive. Samples 10¢. Woody's, Box 164, Asher Sta., Little Rock, Ark.

RUBBER Stamps for hams, sample impressions, W9UNY, Hamm, 542 North 93, Milwaukee, Wis.

RUBBER Stamps: Why wait for cards? QSL with rubber stamps, sample impressions, immediate delivery, Kay, K2UKQ, Blanelet Rubber Stamp Co., 21 Lincoln Ave., Orange, N. J.

DX-100, \$175, perfect; HQ-129X, \$135, new tubes, xfrmr; DX-20, \$25, used only 4 months; AR-3, \$28, exc. cond.; DB-23, like new, \$28. Bill Monk, 1804 Palma Plaza, Austin, Texas.

SELL: SX-101 Mark III and matching spkr, both less than six months old. Must sacrifice due to an emergency. Need cash badly. First \$260 gets it. Joan Silver, 155-11 89th St., Howard Beach 14, N. Y.

300 Watt transmitter; 813 final with VFO, \$250. Also 100 watt transmitter and Meissner signal shifter. \$95. No mken. W0MBW.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8P, Purchase Radio supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmandy 5-3292.

4X150A tubes, \$6.00 each, postpaid. New, surplus, and guaranteed. H & C Sales, 343 Kenmont Ave., Pittsburgh 16 Penna. Phone LOcusc 3-1602.

AUTHORIZED factory distributors for Adjustavit, B&W, Elmac, Gelson, General Electronics, Glas-Line, Gonset, Hammarlund, Hexacon, Johnson, National, Penta, TMC, Tobe & Vocaline & Westinghouse. Wanted: xmtg, and special-purpose tubes and lab equipment. Trade-ins accepted. Open Monday through Saturday. Barry Electronics Corp., 612 Broadway, N. Y. 12, N. Y. Phone WAlker 5-7000.

EARLY issues QST with complete indices, buckram bindings, new condition. R. H. Winchester, ex-8BNY, 196 Rosemont Ave., Trenton, N. J.

TREASURE: Privateer Jean LaFite buried his treasure on Galveston Island south of the Republic of Texas. Treasure hunters will gather on June 19. Data and information available Box 73, Rte 1, Galveston.

NEW Boats, Mercury outboards. Will take ham gear on trade. Write: Boyd Meter, K9IMD, Boyd's Marine Shop, Clinton, Iowa.

SAVE time. Save money! DX QSL's forwarded, 2¢ each after membership. Free flyer "DX QSL Co-op." Box 5938, Kansas City 11, Mo. COMPLETE File QST's, 1915-1951 for sale. Lands, Clayton 2, Georgia.

HAMVENTION Day at Dayton, Ohio. May 9, 1959. Be there? HAM TV Equipment bought, sold, traded. Al Denson, WIBXY, Dayton, Conn.

HIGH Fidelity components at rock-bottom prices. Brand new, fully guaranteed. All ma or makes. Amplifiers, tuners, speakers, etc. Our prices can't be beat! Write for quotations. The Ham's Exchange, 228 Stephen St., Levittown, N. Y.

WANTED: Amateur Radio Call Book for 1927. Write publication date, condition and price to W7H, 419 W. 13th Ave., Spokane, Wash.

HAMFEST June 7th Southwest from Ottawa, Illinois on Illinois Route 71 at the LaSalle County 4-H Home and Pile Area. Same place as last year. Advance registration \$1.00, at the gate, \$1.50. A nice all-day affair for Midwest hams and their families sponsored by the Starved Rock Radio Club. Contact W9MKS, G. E. Keith, Secretary, RFD #1, Box 171, Oelrich, Ill.

COLLINS KWI for sale. In exc. condx. \$2295. R. Gumm, 770 7th, West Bend, Wis.

SPECIAL: 813 Handbook xmttr, 350 watt A.M./C.W. Heath VFO in control panel with relays, etc. TVI-suppressed. All band. Must sacrifice! \$200. Bill Cate, 108 Stadium, Fayetteville, Ark.

CQ All Hams! Have any parts you don't need? I like to get on the air but can't afford to buy transmitter. Would like to build one, anything received, greatly appreciated. Tux. VE2AWO, G. N. Muscat, 1038 Cr. Albanan, Duvrigny Que. P., Canada.

MOBILE Hams! Battery troubles? Les Hay, W7JWD, Rt. 1, Winlock Washington, has the answer to your battery troubles. This is genuine. No gimmicks!

S.S.B. xfrms, exact set of 3 (hermetically sealed) for W2EVL Special, brand new, \$3.00 postpaid. New compact G-E 100-watt modulation xfrmr, mid-impedance (10 lbs), \$6.25; new Elmac vacuum condenser, 12 μ d at 32 kilovolts \$5.50; G-E Pyranolite, 20 μ d at 1000 v.d.c. (330 vac) plus min. 4 for \$7.50; 6 μ d at 2000 v.d.c. (660 vac) - min. 4 for \$5.50; 4 μ d at 1000 v.d.c. (330 vac) - min. 4 for \$3.50. Please include postage, no c.o.d.'s. S. Tucker, W2HLT, 51-10 Little Neck Parkway, Little Neck 62, N. Y.

HARRIS Press QSL-SWLS. Free samples, 518 Milton St., Richmond, Va.

FOR Sale: Homebrew 40-80 meter, 32-watt xmt, in exc. shape, used only 15 hours. \$25. KN9PWR, Hyron Southern, 605 Washington, Kennett, Mo.

SELL: 6 ft. sections Alprodeo T-6W alum. tower, \$4.00 each. Base plates \$1.00 each. Also many parts. W2IIE.

CLEANING Out Shack! Several rigs, beam, rotor, mike and accessories. Send stamp for listing and detailed descriptions. Brummitt, 1912 Holly St., Nashville 6, Tenn. W4WGCJ.

FOR Sale: Complete station including SX-100 receiver, DX-35 driving a 400-watt gridmod grid linear amplifier, VFO, and 50' cables with single switch control, desk; extremely neat set-up; \$375. QST February 1955, present; 101. Jonathan Wachtel, K2UDM, 36-42 206 Street, Bayside 61, L. I., N. Y. Tel. BA 4-8626.

SELL: Plate transformer G-E type R-944 oil-filled 6250-0 6250 volts 2 1/2 KVA, guaranteed irrevocably \$75; Collins plug-in mechanical filter for 75A-1 Model 353-C14 1400 cycles, brand new, unused, \$45; Collins 32V2-3 TVI suppressed, in exc. condx. AM-CW phase modulation. This unit has been bailed from time of its original purchase, \$335. F.O.B. W2BIB.

TWO Meter Communicator II for sale, in exc. condx. w/ \$20 worth of xtals, whip antenna, xtal mike and seven-element beam, \$150; S8SE revr, like new condx, rud Novice revr, \$35; Hy-Gain 14AV vertical, used only one month, \$18. Sorry, cannot ship beam or vertical. Pick-up deal. K2DVI, 48 Club Drive, Roslyn, L. I., N. Y.

SELL or trade: Gonset B2 12-volt 2-meter, \$180 with extras, and T8S-50D with VFO and power supply, \$90. Want: 20A or 10B with VFO. Must be local. W1OGL.

SWAP Good photographic equipment for ham gear or test equipment. What have you? What do you want? W2DQW, Stormville, N. Y.

SELL KWS-1, perfect, \$1275; 75A4, \$425; 32V3, \$400. W3CAV, William Henzly, Unloutown, Penna.

FOR Sale: DX100, \$175; HQ-140X, \$185. F.O.B. Memphis, Tenn. A-1 condx. Wanted: Factory-wired Ranger and push-to-talk mike. W4OGC, 2671 Barron Road, Memphis, Tenn.

K2KJV, Yes, I belong to ARRL. K0RDP.

WANTED: Bandspread dial for Hallcrafters 8X25 receiver. W8QPH, George Toma, 835 Starkweather Ave., Cleveland 13, Ohio.

WANTED: Case for BC611 or BC721 Walkie-Talkie. Will pay cash. K2JZS, K. Wilkens, 37 Huntington Ave., Lynbrook, N. Y. Phone LY 9-0488.

SELL: Tapetone 6-meter converter, GPR-90 matching speaker, both in perf. condx. \$400 or separately. Make offer. K2JNZ, Box 41, Beach Crest, N. J.

WANTED BC794-B revr, must be A-1 condx, complete with tubes. State price and items included. 1L power supply, cabinet. All replies will be answered. Myrtle Borkes, 903 Church St., Hannula 2, N. Y.

WANTED: Used Collins ground xmttr, type 32RA, 3-807s final. George Leininger, W5QZF, 16412 Marquis Ave., Cleveland 11, Ohio.

ONE Owner 75A3. Three mechanical filters - 0.8 CW, 3.1 88B 6.0 AM. Product detector, xtal controlled BFO injection, in FM socket. All recommended modifications, incorporated. First \$400 money-order. K0RHV, 1021 Norwood Drive, SE, Cedar Rapids, Iowa.

HT-18 VFO/NBFM exciter, in excellent condx, \$40; Bert Lenny, W7BIC, 343 Hancock, Maltid City, Idaho.

WANTED: BC-342 RF oscillator bandswit, James Mattia, Fullerton, Nebraska.

SALE: Collins 32V3 transmitter, spare 4D32 tube, one owner, in exc. condx. \$425. W1RK, 271 North Ave., New Rochelle 3-7012.

VIKING II, VFO, mike, low-pass filter, antenna relay, 115V; \$265. Box 364, Paynesville, Minn.

COURIER for sale! Factory-wired E. F. Johnson Viking Courier about eight months old, \$215 cash, no trade-ins. L. A. Morrow, W1VIG, 99 Bentwood Rd., W. Hartford 7, Conn. Tel. Adams 2-2073.

CANADIAN Amateur, \$3.00 per year. 10328 Trans Canada Highway, North Surrey, B. C.

THUNDERBOLT: Want a factory-wired and tested job. State condition and price, and model number. Also want Telex Transiband. W. H. Markham, K2EHS, 100 Van Hook Rd., Secuba 2, N. Y.

STILL cleaning house! BC-375, \$35; BC-171, \$20; BC-645, \$15; SCR 522, new, with tubes, \$25; National SW3, \$15; A8B5 revr, \$20; BC34SG, \$30; APN1, \$4; PE103A, new, with base and cables, \$25; Hallcrafters 8X25 (28-145 Mes AM-FM), \$75; new SX-101 Mark III, \$300; Globe VHF-62 transmitter, new, \$125; WU type 2B teletype, \$60; Gonset Triband (as is), \$10; new polar relays, \$4; Elmac VC12-32 vacuum cond. \$10; many other items. Write me your needs. You pay shipping. R. D. Corbett, W1JJL, 46 Prospect St., Torrington, Conn.

KWM-1, 12V and 110V supplies, mobile tray, matching speaker and Hel Whip 15 and 20 meter antennas, \$1000; will consider trade-in of 20A, HT-30, HT-32, Pacemaker or the equivalent. My gear new condition. W2EBO, 1367 Clover St., Rochester 10, N. Y.

NEED Ham equipment! Will trade Mercury outboards, cameras, appliances, Tvs. Specials: NC-188, \$95; Viking Ranger, \$165; Factory-wired Viking II, \$180; Viking CDC, like new, \$300. Blough Miner, Jr., Hial Hough, W9SP, 7511 Madison St., Forest Park, Ill., tel. FO 6-2750.

VIKING II, \$175; Viking VFO, \$25; Hammarlund HQ-140X, \$175. Jim Shupe, W8HCD, 11 Sparks St., Trotwood, Ohio.

RANGER, like new condx. Will swap for Gonset G-66 and 3-way pwr. supply, or will sell. Easily worth \$250. Make an offer! R. G. Campbell, K8GGE, 7th St. and 9th Ave., Wausau, Minn.

SALE: Elmac 67, mike, dynamotor, relays and cables, \$165; Gonset G66, 3-way power supply, \$165. Super Pro B C1004, 540 Ke-20 Me. excellent, complete, \$80. KD9VA E. Oman, 1103 East Ave., Roscoe, Wis.

DX35, DX40 or similar rig wanted. Ted Dames, W2KUW, 84 Grand Place, Arlington, N. J.

WANTED: 6-meter Gonset Communicator, 6 volt. Local deal. W3AII, Stan Pliska, 4539 Almond St., Phila. 37, Penna.

FOR Sale: Detroit area! Complete break-in station, in exc. condx, and operating. Valiant SX-100 and all the trimmings. Ray J. McConell, K8DAU, 853 Wordsworth, Ferndale 20, Mich., Lincoln 4-7046.

VIKING I, \$125; Viking VFO, \$22; Hallcrafters 8X-28, \$98. For Sale. W8ENH, Clem Wolford, 630 Skyview, West Carrollton, Ohio.

SELL: Johnson Valiant factory-wired, \$345; HQ-110, \$219. Dittmer, W8KFA 2, 2233 Cypress St., Waukegan, N. Y.

SELLING Out: 70 ft. tower, p.p. rotator, 3-band beam, 7581, 3281, 516F2, Par. 4-400As, GG line, many miscellaneous components. Pried to sell, now! W0BBB.

FOR Sale: SX-90, purchased from Harrison, excellent condition, \$110, too busy to use. Floody, K2IKU, 30 Castles, Wayne, N. J. Tel. MO 8-3849.

PACE-MAKER, \$325; Hallcrafters 101-X Mark III with 47 speaker, \$325; 55 ft. telescoping tower, CDR rotor type M and Tri-bander Hy-Gain beam, \$225; Johnston TR switch, filter and S.W. with meter with speaker, \$50. W3CJP, 125 Grand Ave., Hyde Park, Reading, Penna.

NC-173 receiver; excellent condx; with manual, Bargain at \$125. K. Mummery, 1032 Elmwood Ave., Buffalo 22, N. Y.

COLLINS 32V3, in superior condx, inc. spare 4D32, \$450 plus shipping. W7FQV, 37th Northeast, Seattle, Wash.

HAMS, Experimenters, surprise package, 25 different items, \$50 value. Government surplus (unused). Send \$1.95. Kilmington, R9MFZ, 730 S. Sixth, Springfield, Ill.

LOCAL Sale: only! SX-90, priced \$110, K2YQG, 343 Maple St., Brooklyn 25, N. Y.

GONSET Communicator II, 6 volt, sensitive mike, car antenna, house antenna, dummy load, instruction book, used 175 hours. Need \$140. George Bonadue, Public Square, Watertown, N. Y.

SELL: SX-101, in exc. condx, \$300. WV6CBV, Michael Milliron, 415 Concord St., Lodi, Calif.

WANTED: Transmitter (100 watts or under), revr, spkr, antenna relay, microphone, etc. Price must be low. Peter Boudreau, 41 Harriett Ave., Burlington, Mass. Tel. BR 2-9095 (Boston area).

WANTED: CD-618, FT-338 or female connectors from these items. VB-8, VB-9 Gonset 3011. Must be cheap but operating or repairable. WYNZY, 119 North Birchwood, Louisville 6, Ky.

TRADE: Ruger 22 caliber, single-six revolver even for new or perfect WRL 755A VFO, Al Stevens, Granite Falls, Minn., K00GZ.

HQ-129X \$129, HC-794B 1.25-40MC \$175, SP-600JX26 540KC-54 MC \$325, SP-600JX17 540KC-54MC \$395, 51J-3 500KC-30.5MC \$575, 75A-3 \$345, 32V-1 \$275, NC-200 \$119, NC-183D \$194, 540KC-31MC, 48-56MC \$249, HRO Jr. \$50, C.E. 20A & VFO \$225, Pacemaker \$345, Thunderbolt \$490. We make all types receivers, transmitters, test, Teletype eqpt. in trade for NEW Johnson Hallcrafters, Hammarlund, National, Fisher, Heath, etc. Write Tom WIAFN, Allentown-Howard Co., Box 19, Boston 1, Mass. Richmond 2-0048.

FOR Sale: Gonset Super Six, in exc. condx, \$30; Lear Dynaport wire recorder, in perf. condx, \$95; Millen R-9er, \$8; tubes: 1624s, \$6.50; 807s, 1.75; 814s, \$4; 829Bs, \$3. All guaranteed. J. Warner, W8FCF, 1603 Lyon St., N.E., Grand Rapids 3, Michigan.

TWO new Natl. NPW-0 precision calibrated dials, \$15 each; Billie factory-built, xtal controlled (6AG7) exc. outp. 6-10 meters, \$6.50; \$5 buys two stereo organ tapes (1/2 hr x 1200 ft, used once, FM tuner (needs only minor repairs), \$15; also T.V. converter (u.h.f.), tape recorder, (KIT checker; priced F.O.B., W9WFT, 2029 Bradley Pl., Chicago 18, Ill.

CRYSTALS Alarmed. New crystals, Novice, Net, Converter, CD, Citizens, CAP, MARS, General, FT-243 custom finished to .01%, any kilocycle, 5000 to 8700 — 99¢, small hermetic holders, .050" or .093" pins \$1.95. June QST "SSB Package" crystals, sets of five fundamental mix crystals FT-243 \$3.95, dual hermetic \$11.95. Accurately matched FT-241A filter sets, five channel 45 and two channel 46 — \$6.95. Unmatched tested FT-241A — 35¢. Airmailing 9¢ per crystal. Californians add 4%. SSB crystals, all types including KWM-1 converter. Let us know your crystal needs, we will have them all. Crystals since 1933. C-W Crystals, Box 2065Q, El Monte, Calif.

FOR Sale: Hallcrafters 8X-99, \$110; DX-40, \$60; Heath VFO, \$17; Hallcrafters R-46R spk., \$16; all are in excellent condx. Bill Puterbaugh, 6120 Waverly, La Jolla, Calif.

FOR Sale: Harvey-Weiss TBS-500 xmttr, APS-50 pwr supply, National NC200 revr with spkr, Best offer. Ed/WN9JXQ, H. Stine-spring, Rte. 1, Box 767, McHenry, Ill.

WANT: 75A2-3 or 75A4. Have cash and Drake 1A late model, new condx or telescope 3.4x refractor with accessories to trade. Have 3 RA-X-2 surplus revrs, \$20 each. Glen Bryant, Box 105, Kearney, Neb. DX-20, J-38 key, xials, relays and screen modulator; the whole works for only \$55 — all in exc. condx. W6NKS, 18802 Ervin Lane, Santa Ana, Calif.

SELL: 1 KW final, new RK656, B&W coils condenser, \$45; 300-watt mod. Mut. Mach. outp. 100 tht, \$40 on 19 in. panels. Heath antenna, bridge, 90; Collins revr loudspk, \$8; G-E YRS siter, \$25; 32V2 shielded filter against TVI for suppression, \$290; B&W 518B, \$155; Altec Hi-Fi tuner, \$45; Leeco-Neville generator, 6 volt, \$42. Miscellaneous xmitg tubes, meters, parts — write your requirements. Want: Late Drake SSB revr, 600L amplifier, D. B. Whittemore, W2CZU, 36 Masterton Rd., Bronxville 8, N. Y.

FOR Sale: Panadaptor SP44, \$45; plate armer, 1500-0-1500 at 500 Ma, C8S (3000-0-2240 Ma bridged ICAS), Altec 453A preamp, \$20; Bohn B50116 turntable 1675 to 75 rpm with G-7 diamond cartridge, \$22. Coyne radio textbooks, 5 vols. \$15. C. Jaray, 215 Main, Port Washington, L. I., N. Y.

FOR Sale: Complete station of W2FAY, Viking II and Viking VFO factory-wired, \$145; Hammarlund, HQ-140X, 1 w/spk, \$175; HC-221M freq. meter, \$40; multi-tube complete mobile rig, \$225; (A-E-67) (PE125AX) (PMR-7) (PSR612), Mrs. Francis J. Hinz, 10 Cape Cod Lane, Beach Haven Crest, N. J.

DISK Call plates, plastic black or in colors, 1 1/2" x 8", only \$1.00 postpaid. Polished brass nameplate, 1" x 3 1/2", only \$1. postpaid. Bill Clinchard, 120 Ellis Ave., Jackson 9, Miss.

FOR Sale: 57 ft. Aeromotor tower, \$100; fact. wired Vallant, \$333; 4 separate 2507Hs PP KW finals, 10, 15, 20, 40 and 80 meters, TVI suppressed, \$145; Amertran 3300 V, 750 Ma pwr sup, \$75; Stancor 2500 V, 500 Ma pwr sup, \$65; Craftsman 1/2" Dr. Press & mtr., \$60; Class B 500 w. mod. PP 810s, splatter choke, etc., \$50; 6 ft. Par-Metal rack, \$15; 28" Par-Metal cab, \$15; Heathkit 20W amp., \$20. Write for details. C. P. Ross, W9ABA, 2615 Blackhawk, Wilmette, Ill.

ARC-5 Receivers 190-550kc \$12, 3-6mc \$8, 6-9mc \$8. Receiver Tuning Knobs \$1, Dual Receiver Modules \$25, ARC-5 Transmitters 3-4mc, 4-5.3, 5.3-7mc, \$6.50 each, Single Transmitter Rack \$2, Triple \$3, BC-146 Modulator \$3.75, M127 Modulator \$5.50, APN-1 420mc Transceiver \$9.50, SCR-622 two meter Transceiver with AC Power Supply \$95, details upon request, FL-8 Audio Filters \$2. Tubes, brand new 4132 \$22.50, 4-400A \$39, 4-1000A \$65, 4X150G \$35, 4X250B \$39, 757L 1/2, 304TL 1/6, 5894 1/10, 813 \$8.50, 829B \$6.50, 832A \$1.75. Send your tube needs, all guaranteed, C.O.D.'s ok. Bill Slep, W4FHY, Box 178, Ellenton, Florida.

SELL: Gonset Communicator II, 2-meters, new condition, four stat position, \$18X99, new condx, \$115; Heathkit 75A4, Ranger Thunderbolt, will trade. Eugene Simring, K2TDI, 8621 East 55th St., Brooklyn, N. Y.

WANTED: Sixteen MM camera and equipment for use on another area DX. Expiration this summer. Write for complete details. F.O.B. VFO 160 to 10, 600L, National revr, etc. W9OKM, 1207 Oneida St., Joliet, Ill.

SALE: GLOBE Champion 300, SX100 revr, both for \$500, and in like-new condx, with all instruction books. Will ship express collect in original cartons. James Miskelly, W4PLI, P.O. Box 180, Newberry, S. C.

NOTICE! Offering subject to prior sale: Barker & Williamson mod. L-1000-A grounded grid kilowatt linear amplifier, tubes, blower, factory-built pwr supply, no alterations, complete manual, in perf. condx (manufacturer's net, \$495); original shipping carton. F.O.B. firm Price, \$345; Lakeshore Industries transmit/receive switch, manual, \$12.50; Universal Service product detector for 75A-2, 75A-3, brand new, unused, manual, superb sideband, CW, \$27.50 postpaid; C.E. 20A, adjustable, accurate 100 Kc standard wired for 75A-3 (ETC), manual, \$12.50 postpaid. Telephone Indianapolis, Ind. TRINITY 8-2005; write: Edward O. Severide, W9DPL, Route 1, Box 12-B, New Augusta, Ind.

TWENTY-two years of QST, 1936 through 1957, plus eight earlier issues. Nov & Dec. 1945 missing. Best offer F.O.B. W2KWW, Burns, Grand St., New Milford, N. J.

SALE: Excellent NC-183D, speaker, \$300; like new NC-125, \$120; new Harvey-Weiss R9A, \$115; Globe Scout 680A, \$85 and Globe Linear LA1, \$90, both one year and little used; new Heathkit VFO, \$18.50. F.O.B. John Yoder, K4MSN, 1200 Lane Street, Kannapolis, N.C. Carolina.

WANT: Tri-band 3 El beam, 10-15-20. Please state condition and price. W8EHL, 4221 E. 11th Ave., Gary, Indiana.

SELL: Ameco oscillator, \$11.50; headphones, \$1.50, plus postage. Albert Johnson, K1IKK, Newport, N. H.

CLIPPER Speech FCL-1, new, \$12.00; photoelectric relay, Knight, with source light, \$12.00, new, Mannie Teitche, K2VQU, 625 East 8th St., Brooklyn 18, N. Y.

SELL: KC-109, \$125.00; Knight 50 watt xmttr, \$30; Knight VFO, \$20, all in excellent condx. Fred Reiche, K5HAI, P.O. Box 641, Gobles, Mich.

ALUMINUM TUBING, 20¢ ft., piece-meal, 7/8 O.D. .065 wall 6061 T6, 12 ft., 1800 lbs. Sacrifice entire lot for a quick sale. Frank Metal Co., 3301 Gardner, Kansas City 20, Mo., Tel. BE 1-2886.

SELLING OUT, K2RVY.

BARGAINS: CDR Model AR22 rotor and Indicator, \$19; Eldico Antennascope, \$9.00; Hy-Gain Model 144V Tri-band vertical, \$19; Mohawk Midgate pocket tape-recorder with all extras, \$95. Mailed free. W6KKJ, P.O. Box 30, Alameda, Calif.

SELL: B&W 5100 xmttr, in gud condx, \$325.00; HQ-129X with xtal cabl., \$130. Stan Rojek, W2M2M, 715 Windsor Terrace, Schenectady, N. Y.

KH6DT is selling 813 xmttr, 872 and 866 power supplies. Twelve meters, enclosed rack and panel. This would make a swell foundation for a final, Take \$350 or will swap for complete mobile rig. Stored at KEYNY, 196 Malcolm Dr., Pasadena, Calif.

SELL: VHF 152A, in exc. condx, \$35; KW final pi-net 4-250A, new, \$125.00. K6VFO, 412 Begler Ave., San Leandro, Calif. Tel. NEptune 8-7546.

TRANSMITTER BC-191F, brand new condx, 100 watts output, 12V AC and 100V DC, needed. Complete w/ tubes and tuning unit. For 75-80 meters, only \$50. F.O.B. Ironton, Ohio. Irving Crager, K8OPJ, RFD #1, Box 302.

SELL: Heath AR-3 receiver and QF-1, Q-Multiplier, both in gud condx, \$40.00. John N. Preston, 12 Robert Lane, Glen Acres, West Chester, Penna.

SELL: Homebrew 2E26 6-meter xmttr plus twenty watt modulator, \$23.00 and xtal controlled converter, \$7.00. Like new condx Gonset 6-Meter mobile converter, \$35. Saturn Sx, \$10. John Storie, K6JZV, 2427 North Columbia, Tulsa, Okla.

FOR Sale: Gonset Super Six and Superever, new and unused. Stored in trunk of car. \$125.00. Prepaid. Also have used Gonset Super Six, \$35.00. J. E. Greenbaum, W1LIG, 3823 Madison Ave., Bridgeport 6, Conn.

LATE Model HT-30 SSB Exciter, like new, \$300; Gonset Super Six and Superever, \$50. Both prepared to western states. K1JANO, 4207 Forrest Road, Spennard, Alaska.

FOR Sale: BC-654 75M transceiver with Vibropack, \$30; BC-614E less meter, \$20; MAR U.H.F. transceiver, 7-day Chelsea spec clock. Ideal for shack. W6NHT, 824 San Miguel Rd., Concord, Calif.

GLOBE Cheat (factory wired). Modulator, VFO, 209 Karr, Hoquiam, Wash. K2CNY.

NEW Bell 221 Pacemaker stereo amplifier, current model, \$90. Save plenty. Louis Blum, 396 E. Whittier St., Columbus 6, Ohio.

S-40 Receiver: In good condition. Best offer over \$50. You pay the postage. Don Maddox, K5QWH, 838 S. Montclair, Dallas, Texas.

MERCURY Turnstile: A horizontally polarized omnidirectional mobile or fixed antenna. "The most for two meter money!" \$3.95. M. J. K. Radio, Box 2736, Grand Rapids, Mich.

FOR Sale: Complete Novice-General station, HQ-145, DX-35, VFO, \$275. Wanted: Gonset 30-40 Mc. Tuner. W1ZUH, Southboro, Mass. BARSITT Mobile antenna complete with 75 meter vacuum coil, \$16; Master Mobile bumper mount No. 445, \$5.00; Thoradson transformer 3700 CT 500 mils AC, \$25; 3 24d Aerovox 2000V condensers, \$3.00 each; Stancor choke C1403, \$3.50; Millen SWR bridge, \$5.00. Fred Norton, 1450 Winchester, Muskegon, Mich.

CLEANING House! Elmac AF-67, \$115; Morrow converter 5BR, \$45; Carter Dynamotor 6V inp, 375v, at 400 Ma. outp., \$12, with meter 75M and 20M 1, coils, \$5.00; Millen Mod, 90881, 500 watt final, all coils 812As, and fl. xfrmr, \$50; BC606A, \$10; Millen 750V at 230 Ma. pwr. sup., \$40; 75M, 40M, 20M, 15M, and 10M. HDVL coils and 3, 6 and 10 tube line, \$35; pr. 813s, \$8. All F.O.B. K2BHP, 1305 Main St., Vestal, N. Y.

NC-300 and K.W. transmitter for sale. \$300 for NC-300; KW rig 80-10 meters, A.M., C.W., S.S.B., \$1000. W8VSA, 6300 Wayside Ave., Cincinnati 30, Ohio.

3 Band Pre-selector, \$19. K6TWL, San Diego, Calif.

WANTED: Kilowatt parts, coils, condensers, chokes, etc. Kilowatt modulator or parts. Will take complete rig. Am building again. Wot u got? All letters will be answered. W8SHN, P.O. Box 45, Aberdeen, Ohio.

MOBILE Station complete: AF-47 with mounting case, Super-Six with mounting bracket, Gonset squeel-hammer, C-1050 supply, complete center-loaded all-band antenna, coax relay with DPDT contacts, in quantities, excellent condition. Will trade on any equipment. Only \$220. K6ULH, Box 2187, Stanford, Calif.

SELL: DX-40 and Knight VFO. First \$69 takes both. Good condx. Has worked 35 states. Kit bolts for both. K1HXC, W. Willey, 95 N. Main, Peacock, N. H.

SELL: Globe Scout 65B factory-wired, \$65. Ameco 12-record code, \$5.00. K2VEH, Joe Holzman, 115 W. 16th, N. Y. C., OR 5-7157. (Factual name: deal on a Bull recording session?)

CANADIANS: Collins KWM-1, complete with 516F-1 AC power supply, 516E-1 DC power supply, 351D-1 mobile installation kit, Mosley Tri-band mobile antenna and dynamic mobile microphone. All items are in new condx, only a few months old, \$1000 F.O.B. Winnipeg, Manitoba, Canada. Will be willing to ship if required. VE4AT, 128 Lenore St., Winnipeg 10, Canada.

WANTED: Receiver in good condition. Prefer HQ-129X. Give full description and lowest cash price. W3FIT, 122 Hampshire Road, Baltimore 21, Md.

FOR SALE: NC-88 and 636 6-meter converter, \$80. Also Globe Scout 680, \$80. Bill Meyer, K9DDG, 211 North Third Ave., Cedarburg, Wis.

SELL: DX-35 and Heathkit UFO. Both in perfect condition. Both for \$60. K4JFE, 703 W. 12th St., Tifton, Georgia.

MUST SELL: Transcon 10-meter 12 volt mobile xmt-rx-con. See p. 30 in December 1957 QST. Best offer over \$50. K3CTX, 1772 Kilbourne Pl., Washington 10, D. C.

FOR SALE: Heath TS-4A TV alignment generator, \$35. Three months old. FB; Heath AM-2 S.W. R. bridge, new and OK, \$12. Crescent tape recorder. Needs minor work. \$25.00. J. G. David, K4HQB, Box 205, Blahoville, S. C.

WANTED: Early radio gear: Atwater Kent, Grebe CR, Radiolas, Kennedy, Loose Couplers, etc. Paul Galigni, W6GVY, 2429 San Carlos, San Carlos, Calif.

WANTED: Collins 51J late model, good condition. Quote lowest cash price. Karl Hassel, Tower Lakes, Barrington, Illinois.

KWM-1, Serial Number 337 with AC power supply, \$720 F.o.b. Shreveport, Louisiana by Louis M. Gregory, W5FLZ, 3025 Old Mooringsport Road.

DX-100, in excellent condition, with manual. High level negative clipping, rear apron plug for TR switch power. Local pickup preferred but will ship if prepaid. First \$150. Jack Lambert, K2ESZ, 89 Thayer St., Lorraine 7-3449. New York 40, N. Y.

FOR SALE: SX-71, in working condition, but needs alignment, \$90. Meissner signal shifter with coils for 20 and 40 M. \$15. Darryl Kraneuber, 6713 Brookside Road, Cleveland 31, Ohio.

CLEARANCE: All new equipment: 2-4X150A, \$30; 250TH, new, \$25; Heath VOX, \$18. K5TQD, Oma Radio Club, Claremore, Okla. LAMPKIN Frequency meter, used in maintenance in municipal departmental work. Good bargain. Contact: Ecker, 26 Trumbull Ave., Plainville, Conn. Phone: H-5660 7-5663.

FOR SALE: Globe Champion 300-A. Looks new, 7 months old \$395. Larry McCreary, 308 Washington, Franklin, Ky.

IMMEDIATE SALE desired: Excellent Eklife W5Y transmitter, complete, \$20. Signal Shifter, fair, \$10. Write to K4SAR, 3753 1/2 Lents, Louisville, Ky.

WANTED: NC-300. Will pay \$250. Others considered. Will be willing to pick up in Philly area. Bon, K2DUP, 565 North Coles, Maple Shade, N. J.

HAMMARLUND 150, like new conds, \$200. Stan Gonet, 211 Sylvan Knoll Road, Stamford, Conn.

SELL: QST 1926 through 1945 in QST binders for best cash offer. Purchaser must remove same. No shipping. Write W2AEP.

SELL: Complete mobile rig, Elmac AF67, PMR61 rev. James 1050 supply, cables, control box, excellent cond., with manuals, \$240. W3LWN, Box 103, Sigel, Penna.

SELL: Four unused RCA 538 200w. triodes, \$5.00 each. W3YIK.

SELL: QST file 1933 through 1962, complete run, intact. Make an offer. F.O.B. K. Sandstrom, W1BN0, 590 Mount Elm, Flitburgh, Mass.

KEYS: For electronic keys, attractive, precision made, 3 x 4 inch black east base, 3 1/4 lbs., satin finish solid brass construction, dual helle paddles for minimum ambidextrous motion, silver contacts. First ever offered, \$15.50 prepaid in U. S. Card for details, Pouel Electronics, Box 181, Babylon, L. I., N. Y.

SWAP: Collins equipped station, am giving up hamming: 8 line 3281 xmt, 516 P2 power supply, 7581 rev, 312133 spkr, 503 Texrec 3-el, 20-meter beam. Want foreign or American new or used sports or standard car. All letters answered sixty days after publication date of this ad. Ed Ceres, W9GJF, 1035 Westling Drive, St. Louis 19, Mo., USA.

SELL: Heathkit 25 watt W5M amplifier, \$45. Richard Bedard, 126B Wherry, F. Campbell, Kentucky.

"CQ YL"—Only book about YLs, 500 photos, now only \$3.00. Louis Sando, W5RZJ, 212 Sombrio, Santa Fe, New Mexico.

SALE: HQ-100, new, \$150; VF-1, \$15; DX-40, \$60. W50PU, Sam Accardo, 4943 Arthur Dr., New Orleans, La.

FOR SALE: DX-100, \$170; Plesion KE-93 with 6/12 volt Vlnac power supply, \$125. Both items by George Buck, W7HSD, 119 West 6th St., Port Angeles, Wash.

SELL: Hallcrafters HT-32, \$550; SX-101, \$300. K2CVP, 39 Canterbury Rd., Woodbury, L. I., N. Y.

CANADIANS: Sell Globe Scout 66, VFO 755 factory-wired for \$180; SX-100 for \$300. Will pay shipping. Equipment in A-1 condition. W. Sieke, Decca Star, Fort aux Basques, Newfoundland, Cana.

ALUMINUM for every ham need. Write to Dick's, 62 Cherry Avenue, Tiffin, Ohio, for list of tubing, angle, channel, castings, plain and perforated sheet, and complete beam kits.

COLLINS 75A3 with reduction knob, xtal calibrator and 6-meter converter. Beautiful! \$375. W2EFP, 7 Joan Terrace, Montvale, N. J.

SELL: 500/450 watt W7 cone "Uah 5 section transmitter," \$135; DX-100 like new, 1 year old, \$189. Harold Treiber, 1751 West Genesee St., Syracuse, N. Y.

HAMARAMA—Sunday, May 17th, Lake Shawnee, Topeka, Kansas. Mobile hunts, XYL-YL activities, covered dish luncheon. Hams, guests, 150 miles radius invited. Charlie Martin, W9MXG, Chairman, Kaw Valley Radio Club, Inc., 1959 Hamarama Committee.

ADVANCED Modulation equipped Viking Ranger for sale. Factory wired job. Operates with push-to-talk. In excellent cond., \$225 F.o.b. Topeka, Kansas. Charles Martin, Jr., W9MXG, 1268 College, Topeka, Kansas.

COMMUNICATOR III, 6 meters, \$185. K2LKI, 412 Summer St., Schenectady, N. Y.

WANTED: SX-100! Mark III or H-170. State lowest price and cond. W4EFB, 3614 Steele St., Memphis, Tenn.

CLEANING Out my ham shack! Power xfrms, condensers, miscellaneous parts. Send stamp for list. Bill Overdort, W3POZ/4, 5330 Kingsbury Ave., Jacksonville, Fla.

FOR SALE: Viking I, \$125; Mills 9071 VFO, \$40; Telectra 2M, \$25; Telectra 6M, \$25; Mills 90810 trans., \$40; K-2-meter PA w/pwr sup., and 300 watt plate modulator. Write for details. Robert G. Klausner, 4437 Silsby Road, University Heights, Ohio.

TORIODS: Unseen 88 mhy., like new. Dollar each. Five for \$4.00. P.P. DaPaul Co., 101 Starview Way, San Francisco 27, Calif.

SWAP or Sell: 15 ft. 1956 Trojan Custom Queen with 30 horse Evinrude electric starter, big-win motor for KWM-1 with AC pwr sup., Alford Krubert, 70-18 171st St., Flushing, N. Y.

RIG For sale: Like new HQ129X with xtal calibrator, \$150; Globe Scout 680, in excellent cond., \$85. Both for \$225. K2SJC, 9012 New York Ave., North Berren, N. J.

HQ-129X, built-in 100 Kc marker, 17 mhz. K4-multiplex, clean, \$130. K2EIR.

CRYSTALS: For 2.6 and 40 meters and other frequencies, 25 cents each. Send for frequency list. Set of 120 crystals covering 5675 Kc to 8650 Kc. Complete set, unused, \$11.95. R. E. White, W6IMC, 210 Alden Rd., Hayward, Calif.

BARGAINS: Reconditioned and guaranteed. Shipped on trial. National SW54 \$35.00, N300 \$279.00, HROX, N153D; Hallcrafters S38 \$29.00, S85 \$89.00, SX99 \$119.00, SX71, SX96, SX100, SX101; Hammarlund HQ100 \$139.00, HQ129X \$159.00, HQ110 \$189.00, HQ140, HQ150, HQ160, HQ170; Johnson Ranger \$179.00, Vikings II, Valiant, Thunderbolt, Pacemaker; Collins 75A1, 75A2, 75A3, 75A4, 32Vs, KWM1, KWS1; Globe: Gonset; Heath; Elmac: complete sets of reconditioned and new gear. Write for list. Henry Radio, Butler, Missouri.

3-ELEMENT Gonset 3-Hander, converted late model, excellent condition, complete instructions F.o.b. El Paso, Texas. \$75 or your best offer. 2 new RCA 6146, \$6.00. W5LBC, Box 1645, El Paso.

COLLINS 32V3 for sale, like new cond. Also have beautiful homebuilt PPS-13 KW, completely enclosed. Various controlled power supplies, illuminated meters, etc. Must be seen, real buy. Local deal only, this area. Al Grober, WINUZ, 164 Deerfield Rd., Cranston, R. I.

BRAND New Gonset Super Six, \$39.50; Master Model 132JC mount, \$30.00; 3S-50 chip, \$5.00; T-17 mhz. \$4.00; 50 ft. RC8, U. \$3.00; DM-33 dynamotor, 12V, 625V @ 225 Ma, \$5.00; D-401 dynamotor, 12V, 400V @ 185 Ma, \$5.00; deal on University MIL-8 trumpet, worth \$5.00, like new, \$2.50; Bench grinder, less motor, \$3.00, good for ur lab; hoar saw, \$1.50; Black & Decker roto-bone attachment, \$3.00; vibrator lites, \$5.00; Drill line, \$1.00; American Beauty 100w. iron, \$2.00. P. S. Eggert, W9TFL, 11183 Wisconsin, Detroit 4, Mich.

FOR SALE: Johnson Matchstick vertical antenna. In excellent cond., \$80. Dr. M. F. Hash, W7YHS, 319 No. 26th St., Billings, Montana.

SELL: Line to push-pull grid transformer 15 watts audio, \$2.00 postpaid. WANTED: 51J receiver, trade RTTY gear, W7VW.

DX40, \$50; Heath Q Multiplier, new, \$9.00; Heath Halon coil, new, \$8. Erwin Sapro, K1JMH, 9 Dell Drive, East Haven, Conn.

WANTED: Transmitter, 50 to 90 watts, VFO or stator. Receiver, such as SX-99, HQ-100 or HQ-110. Give exact cond. and price in first letter. K4KJK, Box 6080, Charlotte 7, N. C.

SWAP: 1942 Hammond Novachord organ as is for 6 meter Communicator III late model receiver, or make offer. W6CXB, 4254 Niagara Avenue, San Diego 7, Calif.

LYSCO Model 600, \$45.00; H&W Halon, Mod. 725, \$15.00; Johnson T-R switch, \$22.50. W. Groh, 115 E. Liberty, Columbia, Ill.

WANTED: Ham radio instructor, with or without gear, for children's camp. Please send replies to "Camp Sequoia, 708 Bark Court, Wabury, L. I., N. Y."

FOR SALE: Eklife 25A, new sealed cartons, \$16 each; 24C's, new, \$2.00 each; 304T's, unused, \$10; PE-103 dynamotor, cables, sorry, can't ship it, \$14.00; Gonset 100% R modulation indicator, unused, \$8.00; Johnson SWR indicator, \$6.00; pair of Stancor C1415 chokes, Triplex 3435, \$199.00; VM1225A \$29.95; Globe UM-1 \$39.95; HQ-110C \$234.00; Hyline 3E15 beam \$39.95; Lyneo 650 \$49.00; Sonar 120P \$179.00. Wein Conrad \$14.95, Morrow MAH Armchair station \$399.00. "Also many reconditioned items, write Leo, W9GFG, Box 311, Council Bluffs, Iowa, World Radio Labs.

HAMS! Learn mathematics! Practical, Select Calculus, Algebra, Trigonometry, Geometry, Easy Lessons First Four, \$1.00. Mathco, 4266-2 Milmore, Cincinnati 17, Ohio.

SWAP: KWS-1 for late Volkswagens, Volvo, Simca, Dauphine, W5VRY, Tom Holmboe, 6223 McCormack, Dallas, Texas.

BARGAINS: New "Close Out Demonstrators: Carter VSP627 dynamotor \$39.50; TR75TV \$39.50; Eklife GDO \$34.50; Elenco SRH77 \$495.00; Gonset 500W linear \$249.00; Gonset 2 linear \$119.00; S85 \$104.50; S102 \$49.95; Eklife 610A \$159.00; Phasemaster II \$249.00; Mosley VFA-1013-3 \$39.50; Precision III B neitralizer \$399.00; Precision "Snooper" giger \$25.46; RCA geiger \$99.50; Sonar 120 VFO \$14.95; Telrex R100 rotor \$84.75; Telrex R2008 \$179.00; Triplex 3435 \$199.00; VM1225A \$29.95; Globe UM-1 \$39.95; HQ-110C \$234.00; Hyline 3E15 beam \$39.95; Lyneo 650 \$49.00; Sonar 120P \$179.00. Wein Conrad \$14.95, Morrow MAH Armchair station \$399.00. "Also many reconditioned items, write Leo, W9GFG, Box 311, Council Bluffs, Iowa, World Radio Labs.

75A1 perfect with 2.1, 3.1 Kc and 800 cycle filters, \$575; Central Electronics MM2 with I.F. adaptor for AY, \$100; KW Matchbox, \$85; Drake 1A, \$225; pair 8138 grounded grid with VAC variable, and 2" power supply with powerstat, all in 1954; rack, \$225; Polie Ma, \$10.00; \$35; Sico 770A, \$10; Sico 905A1 grid meter, \$45; Roto, no trades! And I cannot ship. Pick-up deal. John F. Babcock, W2ZT2, 1 Ann St., Springfield, Va. N. Y.

ORIGINAL Owner. Factory-wired Viking II and VFO, \$225; Signal Sentry, \$10; Hallcrafters SX-42, \$150. F.O.B. Cos. Conn. John S. Ward, 7 S. Main, Middletown, Conn.

SELL: Six Meter Gonset mobile converter, with noise clipper, vy gud conds, \$30; Six Meter, 20 watt, Telectra Transmitter, brand new, never used, \$45.95. F.O.B. Milwaukee, Wis. K9COP, 2845 South 52nd St., Milwaukee 49, Wis.

FOR SALE: New, Elmac AF-67, PMR-7, 1050 P/S. Deluxe all hand-master mobile mounting rack, cables, relay, etc. Never used. Factory cartons. Company car and XYL problem. Good discount. W. Barnes, K9MZX, 934 Ross, Wausau, Wis.

HARVEY-WELLS Z Match, \$67; NC109 rev, \$134; Hallcrafters SR75 transceiver, \$66; Central 104A-857; Heath DX20, \$32; Motorola Police cruiser receiver, \$28; Elmac ASH transmitter, \$99; Heath 0-10 "booster," \$44; Telectra 220 Mc. conv., \$22; Rectency 10 Mc. scope, \$17; H&W 75 ohm Lo-pass, \$11; Eklife antenna scope, \$20; 10w 110 V AC relay, \$7; Johnson SWR bridge, \$7; Bud 100 Kc. calibrator, \$12; Heath Q-mut., \$7; 840 S-Meter, \$8; Speakers for: 75A4, SX100, NC183, \$10 each. All guaranteed like new cond. F.O.B. Chicago 35, Trener, W9V4J, 2023 N. Harlem Ave., Tel. Tuxedo 9-6430. We pay cash for receivers and transmitters.

813 amplifier for sale, \$75; 2400V/500Wts. Has a bug. Have no time to fix. See write Tom Evans, Jeff Mill Rd., New Canaan, Conn.

SELL: Shure dynamic mic, Mod. 55, collapsible stand and w/20 ft. cord. All in excellent shape, for \$35. WDSBG, 518 Gordon Ave., Nantux, Penn.

WANTED: HQ129X or HQ-140. State price. Wendell Caruthers, Jasper Dr., Madison, Tenn.

FOR Sale or trade: Rollei-cord IV camera with case. Want Globe Chief or Globe Scout with SM-90 modulator. Ralph Roper, P.O. Box 71, Waterloo, N.Y.

FOR Sale or trade: Panda PR-120V, \$150; NCZ-401, \$125; Federal type 804 signal generator, 8-330 Mc, \$125; Measurements Corp. Mod. 75 signal generator, \$85; General Radio heterodyne freq. meter mod. 6161D, \$35; VRV-1 Wire recorder, \$50; miscellaneous parts and equipment. Write for list. Want 75A2 receiver, prefer trade. WGRS, 17139 Bullock St., Encino, Calif.

6 Meter converter, w/tubes and xtal, \$17.50 postpaid. Nat Stinnette, W4AYV, Umatilla, Fla.

CLEAN HQ140X, unaltered, \$175; DX-100, top ends, gnd assembly job, \$165. Reason for sale: bought SSB rig. 2-Motorola 100 watts 30-50 Mc. FM xmtrs, complete w/ant. relays and 6V. dynamometers, \$25 each; 25-50 Mc. dual head end assembly for G-E Progress line mobile equipment; 665 Motorola 15 watt transistor power source, \$30. Need: 304T1 & 6G linear amp. parts and small gen. coverage revr. WD8W, Box 261, Webster, Wis.

FOR Sale: HQ-140X, \$175; Heath DX-20, \$32; Q Multiplier, \$9.00; ant. coupler, \$13.00. Brand new. R.D. #3, Box 179, Medina, Ohio.

ROTATOR: Wanted CDR HAM-M or Roto Brake, W9YRV, 202 E. Thompson, Urbana, Ill.

SALE: Brand new NC-300 with matching speaker, in orig. carton, never used. Best offer over \$300. Tom Prothro, W5HBP, 847 Lee Hall, San Antonio 12, Texas.

WANTED: Mims rotator and indicator. R. Divis, 1613 So. Ruble St., Chicago 16, Ill.

JOHNSON 6N2, \$95; Johnson 2 mtr. VFO, \$25; Comm. L. \$90; Comm. H. \$140; Gouset 2 mtr. VFO and preamp, \$35; linear, \$80; TR850D and AP850 sup, \$75; VHF 152A, \$35; Tecraft 2 mtr; mtr, \$35. H. Palmer, 228 N.E. 172 St., North Miami Beach, Fla.

8X-42-AM-FM "mult", \$125; DX-100/Baluns, \$175; Rollei-cord V with 35 mm Rollin. flash, access, deat. SSB exciter parts, \$25; all band trans, \$7.00; PE-103 \$7; all-band mobile coil \$7.00. Ronald O. Rush, W7GHC, 260 S. Ritter, Indianapolis 19, Ind.

HEATH Kits assembled, fifty percent of the cost of kit plus postage. Send kit or money for kit. I'll bill assembly charge. Robert Slisson-Rout, 2, Hartford, Mich.

COLLINS 75A-4, perfect, like new. Late serial number, 3.1 Kc and 21.1 Kc filters and matching speaker. First money-order for \$650.00 takes it. H. White, Box 521, Greeley, Colorado.

SELL: NC125 with QF-1 and speaker, \$125; 10 meter, 4-element beam, \$15. Pick up deal only. Ed Miller, K2SLG, 436 Ocean Ave., Lakewood, N. J.

MOVING: 32V2 Collins, NC300, No. 19 Mark II, all in exc. cond.; 8X28 v. yd. cond., 50 ft. steel tower, 20M Telrex Supermil beam, U. S. Navy intercom 11-A, FM plotter, 88-108 Mc. Millen SWR bridge compit., TR-4 rotor, hard aluminum 1 1/2" tubing, superselective IF amplifier (QST March '53) not completed, \$200, on parts alone. With complete diagrams and manuals, all inquiries and offers will be answered. Local hams invited to inspect. Everything must go! Wamsdorf, K2GXA, 87 Ridge Road, Rumson, N. J.

SELL: Collins 32V3 perfect cond., \$450.00. Reason for selling: Transferring to mainland. Local sale preferred. Bob Stimpson, 37 Kaupuni Dr., Kailua, Hawaii.

DRAKE-IA receiver, new, serial 613, with factory guarantee and in original cartons and 4 hour 15 min. going mobile. \$220. W4LR/2, 723 Maple Court, Moorestown, N. J.

SELL: Collins 75A-3, serial 11652, like new, with speaker, calibrator, NFRM and manual, \$375; DX-100 with improved keying (QST August 1956); improved loading (QST Oct. 1956); Collins-type knobs, delivers 800 volts, exc. cond.; \$175; 8X-42 with speaker, in perf. cond.; \$150; Telrex 10 meter 3 element beam, \$30; CDR rotator with cable, \$25; Johnson Matchbox, \$25; Teletron-Tape tape-recorder, \$30. Rev. Leon Boarman, C.S.C., 400 Elton Ave., Akron 6, Ohio.

FOR Sale: Collins 310B1 exciter with 6146 dual and allband tuner, \$200, 75A1 receiver, \$225, Both A-1 cond. Also 220 volt, 2 kw Variac, \$28. Will ship P.O. W6SRF, Russ Davis, 1204 North Alamo St., Anaheim, California. Phone PR 4-3710.

GONE Sideband and hi-power. Have for sale: Globe-King 500A, \$450.00; Central Electronics 20-A with VFO and QTL, \$200; Johnson VFO, Mod. 122, \$40.00; (2) Elmac A54, \$75; Elmac PMR-6 w/pwr sup, \$80; RME-100 speech filter, \$25; Edson L. Hart, Jr., W8AZP, Box 183, Sallineville, Ohio.

MULTIMETER For sale. I would like to sell this superior instrument in excellent condition, for only \$20.00. Ron Alspaugh, W6NKS, 18802 Ervin Lane, Santa Ana, Calif.

75A3 with 3 and 6 mechanical filter, 6DC6 RF amp, by Collins and product detector in FM socket. Collins schematic. Spotless. \$375; Commercial appearing tabletop linear in D1XA Bud cab. with power supply, grounded grid 8136 similar to L100A P.E.P. 1500 watts input, \$200; stamped envelope for picture; xfrmr 2500 volts each side of CT. 500 mills each. Sorry, won't ship, \$20. One box of assorted parts (mostly Collins surplus), tubes, coils, xtals, etc. \$5.00. Will ship, K7C, coils, variables, capacitors, etc. W9NHP, 1237-73rd, Des Moines, Iowa.

1 PAIR (2) Vocaline transceivers, Mod. JRC-400, for \$50. W. Jackson, W4AYR, P.O. Box 285, Chatsworth, Ga.

COMMUNICATOR Owners: Modernize, more B plus less wasted power. Seven pin plug-in silicon diode assembly replaces rectifier tubes. No wiring changes. \$8.50 postpaid. John W. Tencas, W1ECI, 926 Yale Ave., Wallingford, Conn.

FOR Sale: National MH-150 Tuner, \$10; Billee CCO-2A oscillator for 2.6/10 meters, \$7.00. Vibropex bug, \$8.00. W2EWS, R. L. Frie.

SWAP: HRO-60 in brand new condition including A, B, C, D, coils, xtal calibrator, product detector inside receiver cabinet, and matching speaker. Used very little. Want: 75A-4 with speaker in similar cond. to match my KWS-1, Wallace Prints, W2KAN, 1177 East 14th St., Brooklyn 30, N. Y. Tel. DE 8-8343.

KWM-1 with AC powr supply, \$675. L. Wecker, W2FZR, 60 An-nukemunia Rd., Babylon, L. I., N. Y.

SWAP 12 ft. aluminum car top boat with Buceanier deluxe 5 h.p. outboard, both in new cond., for late model commercial ham gear. Make an offer. W2UPY, A. Ostrochovsky, 70 Rea Ave. Ext., Hawthorne, N. J.

FOR Sale or Trade: XC-50 Tapetone 6 M converter 14-18 Mc output, \$50 or trade for small Allband xmtr such as TR8-60, DX-40, K20V1/1, 11 Fountain St., N. Kingston, R. I.

VHF Meas. 63 tubes, guaranteed \$1.00 each. Four: \$3.00. P.P. W2QMG, J. W. Fordham, 4621 Sheridan, Chl. Ill.

SELL: 8-85, VY gnd condx, QF-1, Both for \$85; Globe 65-A used 2 hrs., \$75. All three for \$150. Going mobile. Diek Axelrod, 125 Edgehill Rd., Bala, Penna. Phone MO 4-4694.

KWS-1 with automatic ALP, perfect, \$1250; 75A-4, \$475; 75A-3 with Universal Service Product Defector, \$365; HQ140-X with xtal calib., \$169. W8WGA, Barnes, 3451 Ridge Ave., Dayton 14, Ohio. Phone: CRestview 7-0409.

FOR Sale: Johnson Pacemaker, latest circuitry, like new, \$325. Also new transistorized two-tone test oscillator, \$20. K2VGM, 13 Acorn Rd., E. Rockaway, L. I., N. Y.

MOBILE Whip: Webster Bandspanners: 80-10 meters. Best made. For information write to Ed's Radio & TV, Box 83, Oxford, Nebr.

BC779A "soused up" per CQ Dec. '57; v. by, quiet and hot, with pwr supply, cables and book, \$80; v. yd NC-88, \$75; Heath QF-1, \$7.50; BC654 3.1, 6.8 Mc. xmtr and revr, new. Make offer. P103 new, with cables, \$17.50, 4 unused 2C43 tubes, \$5.00 each. K1CRB, 156 Liberty St., Braintree, 84, Mass.

VIKING Navigator, six months old and perfect, \$135; Knight Com-mandant, W1XCN, 3 Eaton Place, Braintree, 84, Mass.

FOR Sale: Apache transmitter, four months old, Works FB, no bugs. \$210.00. SP-10 Sideband adapter, also FB, \$80. Have several pieces of test equipment and Crescent tape recorder. Send stamp or post-card for list. J. G. David, K4HQB, Box 205, Bishopville, S. C.

HQ-110C, like new, \$200. Norman Michea, Phone PO 6-3510, K6PTZ, 11693 Picturesque Drive, Studio City, Calif.

SELL Hammarlund HQ120X, \$90; National 1-10A, all coils, \$25.00. Both in v. yd cond. Local deal only, please! H. I. Griffiths, 4740 Blvd., 39-82 65th Place, Woodside 77, L. I., N. Y. Tel. LI 10-1549.

DX-100. In good working cond., carefully wired, First \$155 or highest offer. K4GYO, 702 Jackson, Williamsburg, Va.

NC101XA wanted. Please advise price, condx: 833A for sale. Stru-bank, 4417 Bedford, Detroit 24, Mich.

INSPIRITOGRAPH with 10 tapes: \$25.00. K7GFD, 225 Linden St., Reno, Nev.

GONSET II 6 meter, 6 volt: \$150 prepaid, \$140 collect. K7DFD/B, Box 148, Palmer Lake, Colo.

TRANSMITTER: 500W to 1 KW. 813 PP final; 2000 volt supply: \$60. Bob Snier, 217 Osborn Rd., Albany, N. Y.

FOR Sale: QST, complete run from August 1939 to end. In perfect condition. W1XCN, 3 Eaton Place, Braintree, 84, Mass.

NC-100 and speaker, \$185; NC-300 and speaker, \$245; CE-600L, \$300. J. D. Groves, K4BN, 1150 Macmillan, Daytona Beach, Fla.

NEW DX-40, crystals, perfect, \$57; National NC-125, immaculate, seldom used, \$125. New Amphenol 139-040 antenna, \$4.00; new RCA 5HP4 CRT, \$2. Gamnet 28-D, Longfellow Drive, Homestead, Penna.

FOR Sale: Hallicrafters SX-100. In good condition. Best offer over \$200. K2QDM, Norman Wise, 108-14 65th Rd., Forest Hills, L. I., N. Y.

SELLING Out: HQ-160, \$305; Heath Apache, \$240; Z-Mateb, \$50; rig used some months since new and in perfect. Don Goodrum, 2819 Plantation Dr., East Point, Ga. K4DBH.

FOR Sale: for the ham builder: a 25 lb. package of assorted electronic items, including toggle switches, rotary switches, assorted capacitors, resistors, variable capacitors, controls rheostats, panel lights, hook-up wire, assorted screws with nuts, phone jacks, coil couplings, chokes, filament transformers, terminal strips, time-delay switches, etc. Removed from new and used, rovt. radio equipment. A real buy for \$10 plus shipping charges. Shipping weight is 30 lbs. We have tons of other gear: transmitters, receivers, power supplies, transformers, tubes, chassis, alystas, filters. Send for descriptive lists. Al Meredith, K2N28A, 35 Forest Avenue, Smithville, N. J.

NC-300, excellent. Completely checked and peaked at National Co. in April 1958. In the original carton with two manuals and receipt for above work. \$285. XCU-300 xtal calibrator for same, \$15; BC-1206C receiver 200-400 Kc, depot recap, unused, \$7. Dave Bernays, K4WGS, Box 2086, Pine Castle, Fla.

MUST sell my like-new Collins 75A4 and KWS-1. Will deliver within 500 mile radius. Best offer. All inquiries will be answered. Paul J. Kehl, W9GFL, 1581 Kimball, Green Bay, Wis.

SELL: Ranger factory-wired, \$275; 8X-99 w/R-616 speaker and plug-in 8-ber, \$135; TR-2 rotator, \$20; G1-1H, \$15. P.O. Kelly, 1427 Treve, 1540 E. Minnesota Pkwy, Minneapolis 17, Minn.

CANADIANS! Am moving to an apartment, no room for amateur radio. Have Pacemaker, Single Sideband, new \$667. Want \$450. Also 20A, Single Sideband, \$250, and P & H linear 400 at \$150. All the above are factory-wired! VESGU, 130 Gardfield Ave., Toronto, Canada.

NC-98 like new: xtal filter. Perfect. First revr cost \$149.95. Will sell for \$97.00. Will be willing to consider equip. or parts in trade. All inquiries insured. K4EJM, 2723 Mimosa, Columbus, Ga.

CLEARANCE Sale: All must go — fixing to move! Send for picture and list our hundreds of items. Terrific discount. Brand new, never used: Gonset Tri-Band 3220 Beam, Lambda modulation monitor, tape recorder (\$55.00); used equipment: all-band Kilowatt, two fine, 10, 100 watt Elmac, Elmac P52-V, AC pwr sup, PCA-2T-200 Pandator, Millen Ruler, HF 10-20 converter, etc.; surplus equipment: BC-221 frequency meter, never touched, ARC5 receivers and transmitters, tubes 30T4L, 832A, 810A, etc. Send for complete list with prices and descriptions. Make your bid — all must go! WANJE, Box 48, Lewisburg, Tenn.

FOR Sale: DX-100 equipped with antenna relay, 1200 mWd variable output load, differential keying, W6GMC, 614 Bradbury Rd., Monrovia, Calif.

CLEANING Out all odds and ends: SCR522 complete, used, \$30; BC-645, new, \$30; General Electric YRS-1, new, \$50; Collins 32RA transmitter, used, \$75. Many other items. Transformers, National Parts, odds and ends. Send for list. W2FUF, 721 Carroll, Teaneck, N. J.

FOR Sale: 3 new Elmac 4E27A/5-125B tubes, \$60 or \$25 each. Walter Madsen, W9VAY, Fontana, Wis.

WANTED: Collins 6 Kc mechanical filter for 75A3. J. A. Buebe, C4QNX, 5021 Ola, Tampa 4, Fla.

WANTED: Viking Navigator transmitter, priced right. Sam Thompson, 602 Pacific Terrace, Klamath Falls, Ore.

FOR Sale: Mobile installation: Gonset Commander and VFO, 3-30 Mc. converter with noise limiter, ant. spring mount, coax relay and dynamometer. Complete, \$130, prepaid. Will sell separately. 145 back issues of QST, 1940-1956 run, \$20. D. L. Robinson, W3SWV, 1609 Westview Dr., New Kensington, Penna.

ELMAC AF-67 transmitter and PMR-6, 12 volt receiver. James Vibrator supply handles both. All in gud grpt. condx and appearance. Go mobile for \$200. W2KJQ, 3930 Anne Drive, Seaford, N. Y. Tel. SV 5-5755.

HAM Selling ten years accumulation of electronic equipment. Self addressed, stamped envelope appreciated. W3IXL, 8435 Cedarbrook Ave., Philadelphia 50, Penna.

SELLING: SX-100 with HQ speaker. In like new condition, \$215. Joseph Marshall, Jr., 22 Clare Drive, East Northport, L. I., N. Y.

TRANSFORMERS: Filament, dual secondary 2.5 volt @ 15 amp, 115 volt primary. Ideal for rectifiers, heater chargers, etc. Write for full information. Carl L. Morgan, KXNHE, R.R. 4, Harrison, Ohio. 250 WATT W.E. audio amplifier, complete with tubes, power supply and manual, \$60 F.o.b. Albany, N. Y. W2GFP, 14 Mountain View Ave., East Greenbush, N. Y.

GONSET 2 meter Communicator III, brand new, in factory carton. Two hundred tubes. W9VCV, 1500 Center Point Rd., N.E., Cedar Rapids, Iowa.

SELL: Heath 0-8 "scope, \$40. W2HFM, 60 Lindgren, Merrick, L. I., N. Y.

10H For sale. Very late model, \$99; Gonset 6 meter linear, \$99; P & H 600A, A1 F.o.b. Larry Houston, W5IHH, 139 Park Ave., Youngstown 4, Ohio.

SWAP: Remington Model 721 bolt action 270 calibre rifle. Weaver "scope and mount, B&W powder measure, Lyman Tru-line, Jr. reloading press with 270 dies for Viking II or equivalent transmitter. Excellent condition. K5QZQ, James C. Campbell, R.R. #1, Calera, Okla.

FOR Sale: Custom built 1 KW LA PR RK65 in final, vax variable, B&W pi-witch, 1 KW coil, 3 meters, tuned grid. Pwr supply, rfr 6000-0-6000 1 amp. C.C.O. U.T.C. swinging choke 8-40 hy. 1 amp, \$725, varic 4000 volt condns. also AM 813 KW modulator speech amp, all for \$300. Also have tubes 6146, two RK65, \$72-813, oil-filled condensers, rfrs, etc. others too numerous to mention or list. Prefer local sale. Come on down and pick up bargains. Cleaning house! Doc Bloomberg, K2CNG, Mayfair 1-5589.

SELL OR swap: Dumont oscilloscope 208 perfect, \$35; Globe Scout 600 factory-wired xmttr, 50-6 meters, \$75; ART-13 and RAL schematics, \$36; W3IHD, 4900 Boanue Dr., Washington 21, D. C.

BUYING Apache, selling excellent Knight xmttr, \$25; complete portable xmttr-rvr portable, \$25 plus misc. gear. List available. Chas. Dutton, W9QLK, Rte. 2, Box 91-B, Elgin, Ill.

SELL: Simpson 303 VTVM, new condx, \$45; BC348Q, 110 VAC and 12 VDC plus-in pwr supplies, \$35. F.O.B. Rochester, Mich. W5WHG, 501 Nawakwa, IL 2-4668.

SELL: Factory-wired Globe Scout 65A with companion Heath VF-1 modified 6AG7 ope. for extra drive. Both for \$75. Perfect shape. Write to Lyle Mattice, 4555 Calne, Priley Hall, Ames, Iowa.

FOR Sale: Johnson Vallant, 200-275 watts; factory-wired; about 1 1/2 years old, used but little, excellent. Replacing with higher power. W2PMR, 433 Arlington Ave., Moonfield, N. J.

VIKING II for sale, excellent condition, looks like new with instruction manual and keying modification kit: \$150. Robert Sprung, W9CFK, 4847 W. 9th Place, Oklawm, Ill.

SALE, cheap, 20A, accessories, HQ-140X Hickok oscilloscope, Jim Tucker, 1303 West Louisiana, McKinney, Texas.

KWS-1, \$1375; Combo HT32, HT33A, \$1100. Forward stamp for cleaning house bargain list. W2ADD.

FOR Sale: RME 4300 plus QF-1 and Globe Chief, nice combination for the Novice. Both are in excellent condition. Am asking \$200 or best offer for both. Also new 2 meter H-pwr RCA transmitter, including 3 extra 4-125As and a converter; will trade for a 75A-2 or -3; will be in vud condx. Write K3AAF, Bryan Davis, 2010 Wallace Ave., Silver Spring, Md.

KWM-1 wanted. With or without accessories. R. Yeager, 1455 Wilson Ave., Chicago 40, Ill.

100 QSLs, \$2.50; samples 156. One Week Delivery! Arthur Greenberg, 3433 DeKalb Ave., Bronx, N. Y.

COLLINS 32V3 transmitter. Perf. condx, \$450. Chicago area deal is preferred. Richard Karl, 2836 Leland Ave., Chicago 25, Ill.

RG59/U, 56 ft. any length, minimum 50 ft. RG58/U, 30 ft. lengths with connectors, \$2.95 ea.; 2 for \$5.50; H862/U with boom mike, 600 ohms, \$4.85; J-48 kit, \$1.50 w/cond; 840VCT 60 500 Ma. plate transformers, 1 1/2 or 220 Pti. \$6.00 ea., announcing a great new parts kit of genuine gup surplus parts. Value over \$30. No junk! \$3.95 ea. Complete satisfaction or your dough back on all sales. Lee Industrial Surplus, 25180 Van Born, Inkster, Mich.

RANGER For sale. Factory-wired in A-1 condition with PTT and keyer, \$195, SX-100, in exc. condx, \$220. KG9ZF, 6114 N. Kimball, Chicago, Ill.

100 WATT phone/c.w. xmttr. Bandswitching 80-10 meters, power supply, rack cabinet, \$95; Meissner Signal Shifter, \$25, 50 watt, 2 meter xmttr, pwr supply, rack cabinet, \$95; HT-19 185 watt xmttr, \$95; 2 meter xtal controlled converter, power supply \$20; prop pitch motor, \$25; 6 element 2-meter beam, \$7; 3-el. 10 meter, \$10; 3 element, 20 meter, \$15; UConn Radio Club, Cut, U-37, Storrs, Conn.

WANTED One used flying spot scanner, 525 lines 60 fields 30 frames with or without FM modulation tuneable one TV channels 2 to 6 C. Charles Engbarth, 402 Claiborne St., Biloxi, Miss.

WANTED: 6 to 12 304TL tubes. Callanan, W9AU, P.O. Box 155, Barrington, Ill.

FOR Sale: Central 600L, used less than 5 hours, \$350. WSPVC, 4619 W. 156th St., Cleveland, Ohio. Phone W1-8186.

COLLINS 310-B3, \$160; H RO Jr. with coils and power supply, \$50; Tefarft 15 meter converter, \$20; BC453, \$10; local sales only. Will not ship. J. Forgas, W2AAS, 4305 Furlan Ave., Brent 66, N. Y.

ATTENTION SSB, DSB and AM operators! Pre-emphasized narrow-band speech filter. Concentrates modulation intensity on audio-frequency range possessing greatest communications intelligibility. Tested and tested. \$12.95. Fitch Labs, Box 222, Hastings, Nebraska.

ATTENTION Boat owners: Best Marine radio, model SLEM, 115 AC or DC. Has slight hum but otherwise in perf. condx. A really nice receiver for only \$175. Write your deal to K5MQK, 2000 McColough Ave., San Antonio 12, Texas.

A MILLIAMMETER for less than the price of an NE2 neon lamp! Impossible! Not at all. "How to Make a Meter" gives plans, templates and instructions for making an Astatic oil-damped galvanometer with a few pennies worth of material. It tells how to adjust balance, linearity, damping and calibration of the meter. Originally designed to monitor transistor circuits, the meters have proved useful and surprisingly stable. You can make as many as you need from the simple plans. For your copy of "How to Make a Meter" send \$1.00 to L. Baker, 40 Schley Ave., New Rochelle, N. Y.

FOR Sale: Johnson Ranger, \$195; Viking II with VFO, \$195; Mobile with VFO, \$95 less VFO, \$75; Adventurer, \$45; Vallant professionally wired unused, \$35; Hammarlund HQ-100, \$145; HQ-100C, \$165; National NC-303, \$295; HRO 5071, \$295; NC-125, \$119; Brown Electronics, Inc. Art Brown, W1H2, 1032 Broadway, Ft. Wayne, Ind.

SELL: LM-136, meters, tubes, power supply components, etc. Stamp for extensive list. Will trade for mint. F-VF stamps. W4DWF, 911 26th St., Arlington, Va.

VIKING II with Viking VFO, \$200; Stancor ST209A, \$25. F.o.b. Rochester, K2KBL-2, 25 Amherst St., Rochester 7, N. Y.

SALE: DX-100 in gud condx. Cheap for quick sale. Local sale. Philadelphia area preferred. K2QLL, John Kane, 27 School Lane, Haddonfield, N. J.

FOR Sale: Latest model Harvey-Weiss R-9A double conversion receiver one month old, \$90; also professionally wired DX-40 transmitter, never on the air, \$70. Both \$150. Donn Bacon, Box 117, St. Clair, Michigan.

JOHNSON Viking II with VFO, perfect, \$170; NC-300 with matching apr. and coils, like new, \$270; Heath VTVM, \$12; Heath ant. impedance meter, \$6.50; tubes, new 813, \$7.50; 872A, \$2.50 ea. Shure CR mikes w/stands, \$5.50. C. F. King, W5TVO, 22861 Edgewood, St. Clair Shores, Mich.

WANTED: Globe Scout, factory-modified, \$65; Heathkit VDO, \$15. W5VET, 8067 Lashell, Baton Rouge, La.

RECEIVER for sale: NC-100 matching speaker, xtal calibrator, one year old. In perf. condx: \$165. Free delivery in some areas East coast. Clement, W4CHH, 4404 17th St. N., Arlington, Va.

SELLING DX-35, \$44.95; B&W Tr switch, \$15; Heath VFO, \$17. All in gud condx. W2QCT, 251 Price St., New Rochelle, N. Y.

RECEIVERS: New! All Halliters, Hammarlund, used: NC-188, \$125; 8-94, \$39.95; Trades, Jim, W3VGC, J. V. Stout Co., 4640 York Rd., Baltimore 12, Md.

FREE "As Is" Heathkit VFO on purchase of my Globe Scout 650. K2VDS, D. Alberts, 166 E. 92nd St., N. Y. C.

WANTED: Vacuum variable condensers, 5-500 uad (Jennings UC5L-500 D KV), 20-2000 uad (Jennings UC5L-2000 D KV), quote lowest price. Joe Shank, Jr., W8KBT, Box 1486, Huntington, W. Va.

WANTED: 800 cycle filter, 455C-08 for 75A-3. Have to trade 6 Ke filter for 75A-3 or WRL VFO Model 755, brand new, never used. W2PDB, 278 S. 2nd St., Buffalo, N. Y.

TELEVISION Camera with transmitter, RCA type, ATJ; excellent condition, unmodified. Make offer or trade for 6 meter Communicator. Dave Baxter, W5KPK, 4211 Coneho, Dallas, Texas.

DX-20 for sale, in excellent condition, \$30. Ocean Hopper, 6 colls, \$10. Doug Stevenson, 6606 South Lynch, Flint 3, Mich.

COLLINS 310H exciter, for sale. Excellent condx. No modifications. \$175.00. R. Yeager, 1455 Wilson Ave., Chicago 40, Ill.

HQ-129X, mint condx, \$129; VHF-152A, \$25. Pick up. Master bumper mount, \$4.00. W1PRT, 19 Bidwell, Bloomfield, Conn. CH 2-9355.

SELL: 32 V2 transmitter, two D432 tubes, \$275; new Pierson KE-93 revr, 6/12VDC Vibrapack, \$175; new Master Mobile Mount No. 666 coil, No. 444 bumper mount, antenna sections, \$30; BC-645, 465 Mc. trans-receiver, 12/24VDC dynamometer, antennas, L-1-L signal generator, \$30; MO-1, 3-8 Mc. trans-receiver, \$14; items P&B. Oden. Following postpaid: new Johnson directional coupler and indicator; \$33; 12VDC dynamometer, 440VDC-200 Ma. \$11; B&W TVI filter, \$13; 2 6VDC Vibrapacks, 300 VDC-100 Ma. both for \$10; New Harrington GP-50 tank assembly, \$10; Lowell Maw, W7NHQ, 1419 Swan St., Ogden, Utah.

FOR Sale: NC-87, all-band and hambands receiver with QF-1 5.4 Kc. to 55 Mc. \$35; DX-35, \$35; 5-tube 2-meter converter with P.S. IF 14-18 Mc. \$45; 6-meter converter IF 27-29, \$30; 6- and 2-meter VFO with P.S., \$50; 6-meter xmttr 6146 final, \$25; with P8 Turner 33D mike and stand, \$20; 25 watt modulator with P.S., \$45 (plus postage on all items). Richard Mehner, W2PQU, 408 West High St., Glassboro, N. J.

FOR Sale: Elmac AF-67, \$110; PE-103 w/cables, \$10; MM all-band mobile antenna, \$8; Dow 6v coax relay, \$5.00; Micro-2 Match, \$5.00; Hammarlund AM-PM receiver (27 Mc. 146 Mc.) K2ALO, Hanson, 37 Lake Ave., Eatontown, N. J. Tel. LI 2-0720.

RME 4350A revr, brand new, \$195; will ship anywhere in U. S. A. Express prepaid. L. F. Lytle, 419 Stonegate Rd., Peoria, Ill.

SELL: 2 KVA Amertran xmttr, 6200 volt CT 700 mls. \$50. B. F. Monteth, Douglas, Wyoming.

KRO5071 in excellent condx, \$250 or will pay difference on a 75A4 in similar condx. BC221 with xtal and original calibration book, \$50; T47A/ART13 in excellent condition, latest "A" model, \$65. M. D. Haines, W5QCB, 1316 S. W. Military Drive, San Antonio 21, Texas.

SELL: B&W 518B. Original owner. In mint condition: \$175. W4IEH, 941 Country Club Circle, Ft. Lauderdale, Fla.

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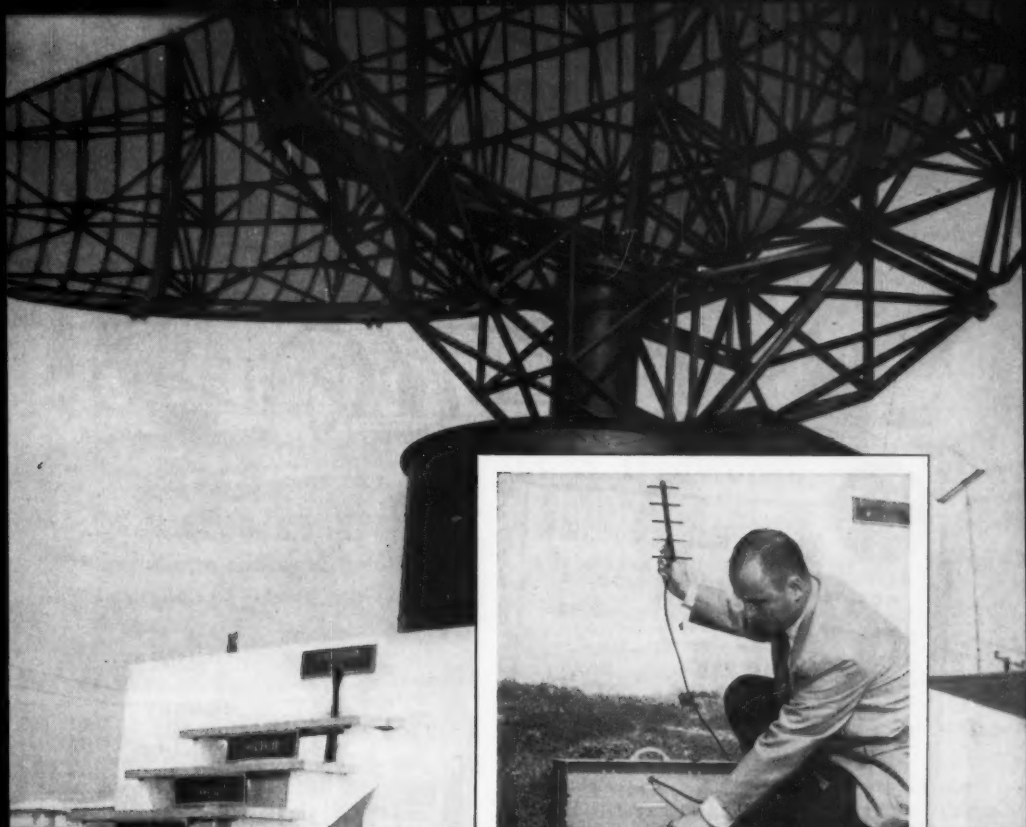
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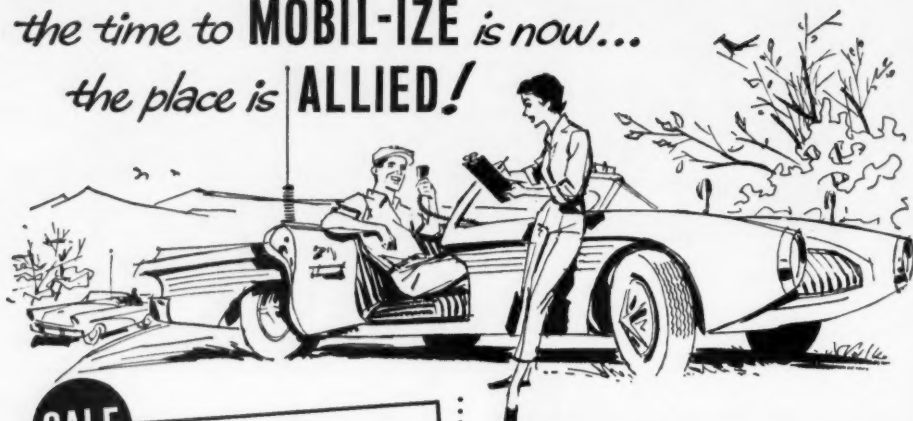
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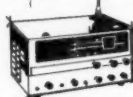
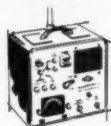
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National News Dial



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High-Perveance RCA-7094, the popular, priced 500-watt-input beam power tube that puts more watts into the antenna.

Topside view of the ARRL 500-watt Transmitter as described in QST, February 1959.

Again **QST** DOES IT... ...with an RCA-7094



Pictured here is QST's recent 500-watt transmitter. Note the professional layout—ready to go on any band from 10 to 80. Then note the power tube in the final socket. It's an RCA-7094 Beam Power Tube—and RCA is proud to see it there.

Why is the RCA-7094 a growing favorite with transmitter men going QRO? This: RCA-7094 is a high-perveance, high-power type—takes 500 watts input on CW with only 1500 volts on the plate! RCA-7094 has high power gain—drives to full input up to 60 Mc with less than 5 watts driver output (from a single RCA-2E26 or even the RCA-5763). RCA-7094 will deliver more watts to your antenna than low-current, high-voltage types with the same input because the plate-voltage swing is lower—and, consequently, plate-circuit loss is lower.

So for a lot of output watts for your power tube dollar...for a half-gallon input with lower voltage-rated components...for better plate loading at higher frequencies, design around the RCA-7094. It's available through your RCA Industrial Tube Distributor. For a technical bulletin on RCA-7094, write RCA, Commercial Engineering, Section E-37-M, Harrison, N. J.

RCA-7094
Typical Operating Conditions (ICAS)
at 60 Mc

Type of Service	CW	AM	SSB AB,
DC Plate Volts	1500	1200	2000
DC Grid—No. 2 Volts	400	400	400
DC Grid—No. 1 Volts	—100	—130	—65
DC Plate Ma.	330	275	200*
DC Grid—No. 2 Ma. (approx.)	20	20	35*
Required Driver Power Output Watts (approx.)	4	5	4*
Useful Power Output Watts (approx.)**	340	240	250*

*Maximum-Signal

**90% Output Circuit efficiency



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Harrison, N. J.



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